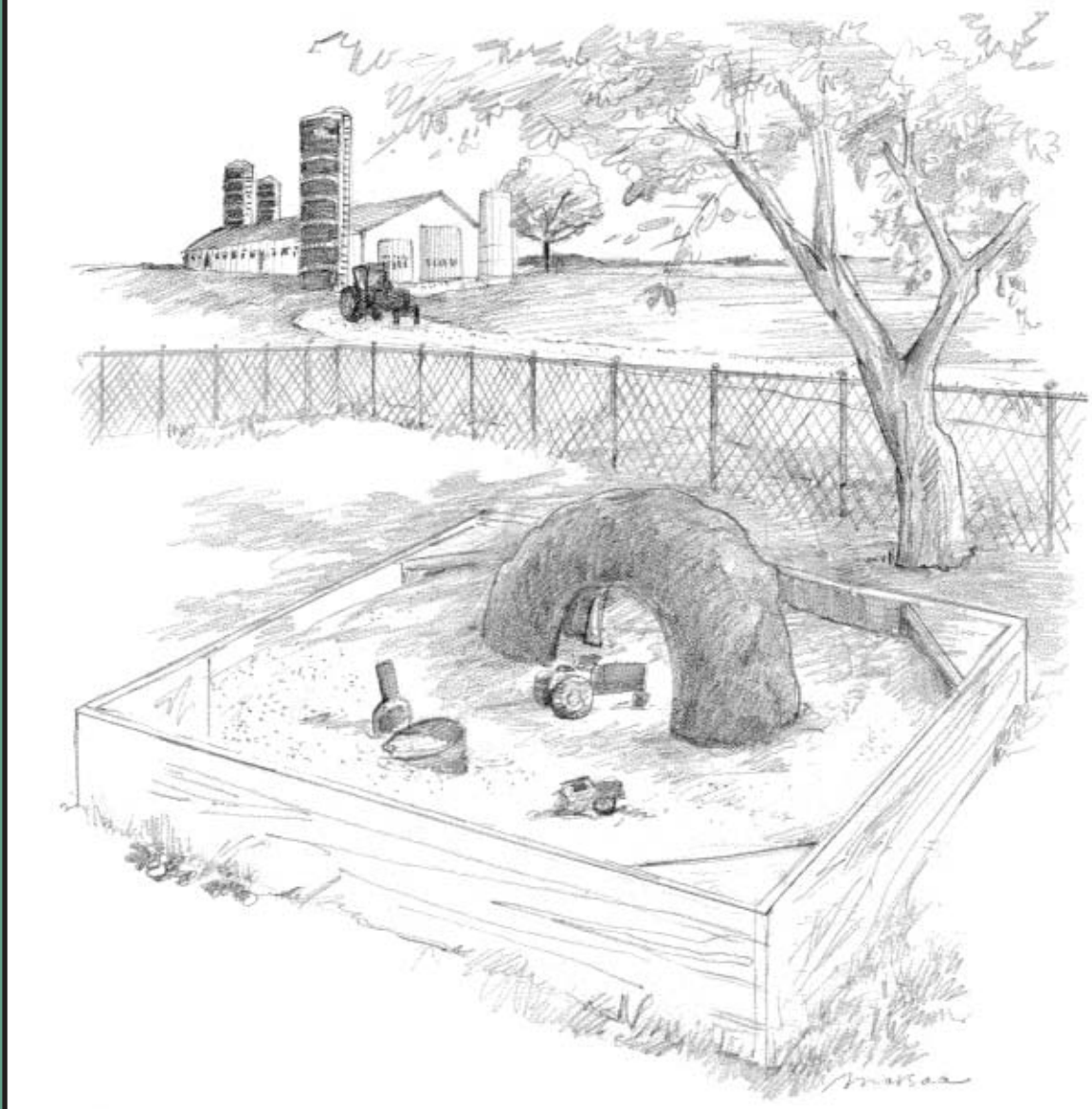
Creating Safe Play Areas on Farms

National Children's Center
for Rural and Agricultural Health and Safety



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Barbara Lee, Ph.D., Director
National Children's Center

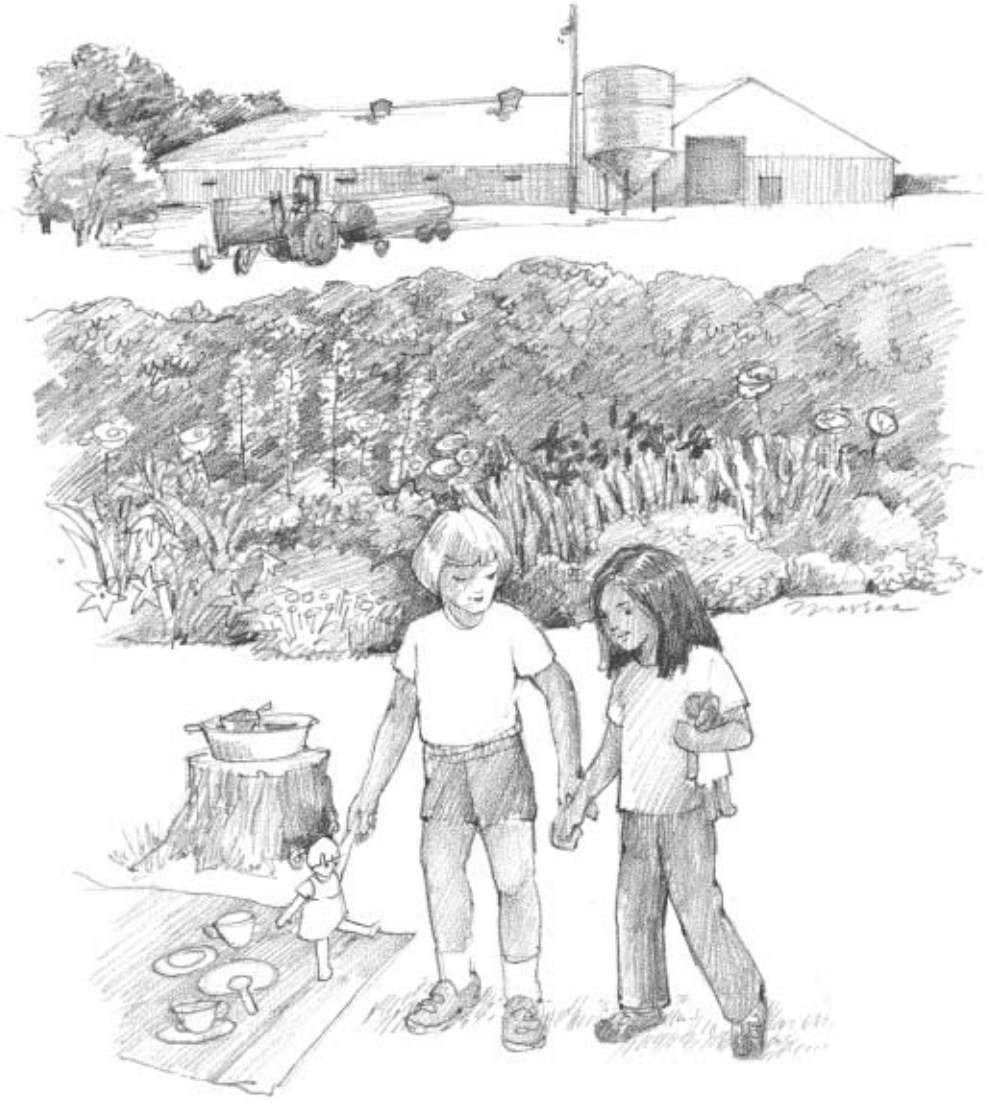

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Table of Contents

Every child deserves a safe place to play.

Introduction

"Creating safe play areas on farms requires merging the key concepts of playground safety, farm safety and environmental health with supervision."

Nancy Esser
Agricultural Youth Safety Specialist

Children are curious and perceive the farm as a gigantic playground. But children do not recognize or understand dangers and cannot easily remember rules from situation to situation. They must be supervised and reminded often about where they can go and what they should avoid. If off-farm childcare is not an option, then it is important to have the safest place possible for children to play on the farm. Many farm owners provide play areas for children, but are they safe? These areas could be improved if key concepts of farm safety, playground safety design and adult supervision are merged.

This guidance document has been developed as a resource for safety professionals, farm and rural community leaders, and farm owners who want to understand important features of safe play areas for children who live on or visit farms, ranches, orchards or other agricultural settings. The focus is on children between the ages of 2 and 10 years old. The information is a resource to assist in designing a play area that is based on:

- characteristics of children who will use the area,
- adult supervision,
- the site's agricultural and environmental conditions, and
- recommendations for play activities.

There are no guarantees that any play area is truly "safe." Behavior of children is unpredictable and, developmentally, children are not ready to consistently make safe decisions. Farm owners and parents are busy people and do not always set realistic expectations. Agricultural work and environmental situations are always changing. This combination of uncertainties about children, adults and agriculture can make farms especially unsafe for children; and the authors readily acknowledge this concern. The goal is to preserve the best elements of living on and/or visiting farms so that children can grow into healthy, happy adults with fond memories of playful times in their youth.

NOTE: For this report the term "farm" is used broadly to reflect any type of agricultural production enterprise.

Why are safe play areas on farms important?

Agriculture is one of our nation's most dangerous occupations. Hazards include machinery, tractors, chemicals, livestock, work structures, ponds and ditches, and other components of the farm work place. Farm yards include hidden and visible hazards that are sometimes overlooked. People underestimate their potential for problems or say they are just too busy to make necessary changes. Each year more than 100 children are killed and 32,800 seriously injured on U.S. farms; and the highest rate of injuries involves children younger than 10 years old (Myers and Hendricks, 2001).

Within residential playground settings, including farms, injury reports indicate that more than 50,000 children are injured and about 10 are killed annually. These events are associated with falls from play equipment, strangulation by clothing or draw strings that become entangled on protrusions (especially vertical projections more than ⅛ of an inch), head entrapment from feet-first entry into an opening between 3½ inches and 9 inches, and injuries resulting from equipment tipping over (Tinsworth and McDonald, 2001).

On farms, play-related injuries are complicated by myriad issues associated with agricultural production. Children lack the judgment to decide what is safe and what is not safe. They may ask to ride on a tractor or watch workers in a busy milking parlor. As much as we value parents and children sharing high-quality experiences, a parent or supervising adult must consider the consequences of his or her decisions. When a child is injured or killed on a farm, there are ripple effects. In addition to the family grieving process, there are implications for the farm's economy, family adjustment and, in some cases, legal liability. No amount of money or grieving can reverse the life-long impact of a preventable childhood injury or death.

Farm Safety Audit It is important to make the entire farm safe. Many farm safety audit tools are available, asking questions such as, "Are farm chemicals stored in locked cabinets?" Check page 23 to locate an audit checklist for your needs.

What to remember about children

- Children depend upon parents and other adults to protect them.
- Children should never play in or near farm work areas.
- Children visiting a farm need rules explained and enforced by an adult.
- Children are curious.
- Children have a short attention span.
- Children do not easily remember rules.
- Children cannot fully understand the risks or consequences of serious injury.
- Children develop at different rates and have different interests.

Pages 26 – 27 include a Childhood Growth and Development chart to better understand children and their play and safety options based on age and developmental characteristics.

What to remember about parents

- Parents often believe their children are brighter and more mature than other children the same age.
- Parents tend to over-estimate their children's ability to understand concepts.
- Parents under-estimate the risk of disease and injury associated with routine tasks on farms.
- Parents want to start teaching their children about farming at a very young age.
- Parents sometimes believe that benefits of being on a farm, such as learning a strong work ethic and responsibility, outweigh risks of disease or injury.
- Parents can judge their neighbors' unsafe practices more objectively than they can their own.
- Parents assume injuries will occur on somebody else's farm but not their own.
- Parents might lose sight of children when busy with other tasks.
- Parents sometimes justify unsafe shortcuts to save time.
- Parents might allow an unsafe activity "just this once" because it is "fun."

What is a Safe Play Area?

Leading causes of serious play-related injuries *include falls from play equipment onto unprotected ground surfacing, strangulation by clothing that becomes entangled on vertical protrusions and projections greater than ⅛ inch, head entrapment from entry into an opening between 3½ and 9 inches and injuries resulting from equipment tip-over.*

A safe play area is a carefully planned, designated location with limited exposure to hazards such as traffic, agricultural production and environmental concerns. With effective adult supervision, safe play activities allow children to experience physical, emotional, social and intellectual development. Safe play requires adults to use child development principles and safety guidelines to decide where and when a child may engage in different aspects of play. Safe play areas can include activities that use a combination of items on the farm, from the natural environment or manufactured play equipment.

The play area location on a farm should be:

- Designated by boundaries or physical barriers such as fences, gates or shrubs
- Away from car/truck/other vehicle traffic
- Away from hazards such as machinery or unstable structures (tractor tire leaning against building)
- Away from loud noises
- Free from open water, where children can drown in as little as 2 inches of water
- Adequately shaded from sun
- Adequately sheltered from wind, dust or hazardous airborne particles
- Protected with a strong barrier separating children from farm animals
- Within sight and sound of a responsible adult
- Close to first aid, hand washing and toilet facilities
- Small or large enough to match the amount of space needed to play safely
- Easily and regularly maintained with grass mowed and snow removed
- Where there is minimal risk of snakes, fire ants or other "critters" (e.g. ticks, mice, mosquitoes) that interrupt play or pose a health hazard

The play area equipment on a farm should be:

- Appropriate for the ages of children who are using it
- Spaced with other pieces of play equipment to allow for minimum risk of injury such as falling from one structure and striking another structure or a swing hitting a person or a structure/piece of equipment
- Free from entrapment hazards, spaces greater than 3½ inches but less than 9 inches, that can prevent withdrawal of a child's body or head
- Without bolt ends, edges, or other protrusions that extend beyond ⅛ inch, which can catch strings or clothing worn around a child's neck, or cause skin injury
- Absent of lead-based paint, creosote and chromated copper arsenate (wood treatment)
- Devoid of pinch, crush, shearing, and sharp edge hazards that could cut skin or crush a body part
- Surfaced with appropriate ground material that is maintained at an appropriate depth to cushion a fall (refer to Table 1, page 18)
- Surrounded by a use zone that includes appropriate ground surfacing extending beyond the area just beneath the piece of play equipment (refer to Table 2, page 18)
- Smooth to avoid wood or metal slivers
- Constructed of a material that does not absorb excessive heat from sun exposure
- Securely anchored to prevent overturns that can crush a child
- Played with as the designer/manufacturer intended
- Well maintained by an adult

Safe play should include:

- Competent supervision
- Changing play opportunities and equipment as children grow and develop
- Wider boundaries or zones for older children (e.g. for playing ball or hide-and-seek)
- Safety rules for all children, including additional explanations for visitors
- Consequences for children who break safety rules

News Clippings

Child has arm amputated in farm incident

Franklin, WI (AP) – A 4-year-old girl was hospitalized in fair condition Wednesday after her arm became caught in a corn chopper. Police said the child wandered away from her backyard sandbox and into a field where her father was harvesting corn. The father was looking at what he was chopping and did not see the girl.

'Three-year old alive after falling into manure pit'

'Milk truck backs over youngster riding his tricycle'

'Toddler suffers esophageal burns after swallowing farm chemicals'

'Child's head crushed after falling from tractor driven by grandpa'

Why are Some Play Areas NOT Safe?

Farms often are sprawling areas containing buildings, machinery, animals, chemicals, tractors, ATVs and work tools. These very objects pose risk of injury to children who have access to them. Characteristics of UNSAFE play areas relate to a farm's location, equipment and options for adequate supervision.

An UNSAFE play area that puts children at increased risk of disease or injury may be located:

- Near driveways or machinery paths without barriers
- On or around tractors, ATVs, farm machinery or livestock
- Too close to a workshop or barn that produces airborne dusts and noise
- Too close to water hazards, manure pits or ditches (drainage, irrigation, canals)
- Too close to fields where chemicals are sprayed
- Too close to chemical and fuel storage areas (poison, fire, explosion hazard)
- Near an area harboring concentrations of infectious bacteria (animal waste)
- In hay lofts, empty silos, grain bins and other commodity storage units
- In an area with limited visibility for effective adult supervision

Play equipment would be UNSAFE if it is:

- Not anchored or safely secured to the ground to prevent tip-over
- Lacking adequate protective ground surfacing that cushions falls
- Worn and weathered showing rust, chipped paint, missing parts, cracks or deteriorating surfaces
- Played with incorrectly or misused

UNSAFE substitutes for childcare and play location

Parents sometimes ask "Is it OK to arrange a play area inside a barn?" or "Is it OK to put an infant inside a tractor cab if he/she is strapped into a car seat?" This is comparable to taking a child into the midst of a construction site or a factory. Such practices are not acceptable because they are inadequate substitutes for attentive care when the parent/adult supervisor is trying to complete farm work. This creates two problems: 1) the child is not adequately supervised, and 2) the adult can be distracted from conducting his/her work. Further, these work environments expose children to hazards such as airborne dust, noise, vibration and other contaminants which may, in turn, lead to chronic health problems such as asthma, hearing loss or muscle and joint pain.

What are the Elements of Effective Supervision?

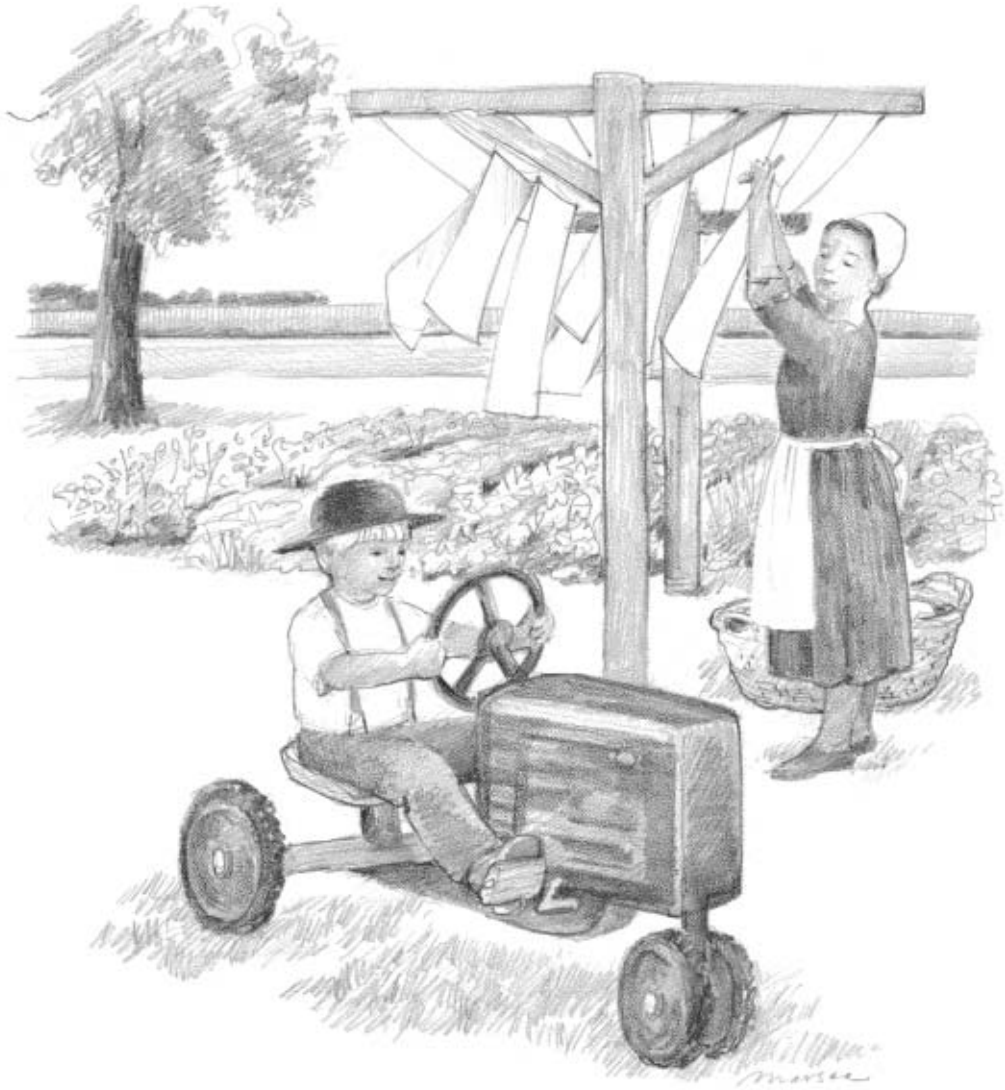
Good adult supervision involves careful, attentive monitoring of a child. While the home is often perceived as a fairly safe, controlled environment not requiring stringent supervision to children (Peterson, L., et. al.), the area outside the home on a farm can be unpredictable and uncontrollable, even within established boundaries of a safe play area. Given the unpredictable nature of farm work activities, expansive space, buildings and machinery, the following supervision guidelines are recommended for a safe play area on a farm:

- Constant supervision means that an adult is always within sight and sound of a child.
- Intermittent supervision occurs when an adult is out of sight and sound for up to 15 minutes.
- Periodic supervision involves visual observation of a child at least every 15 – 30 minutes.

The proper amount of supervision depends on the age of the child, the number of children engaged in play, the type of play occurring and the location of play.

NOTE: For this report the term "adult supervision" is used broadly to reflect any competent and caring individual, including adolescents who have been properly trained to supervise or "babysit" children.

Play areas are not a substitute for careful, competent supervision. *If adequate supervision is not available in the home or play area, parents or guardians are responsible for seeking off-site childcare. For assistance in securing trained babysitters or locating childcare services, contact the local Red Cross chapter, County Extension, childcare referral agency or nearby spiritual service provider.*



Children 2 to 6 years of age need constant supervision during play. They are slowly developing their muscles and balance. They are learning about spatial relationships and how to solve problems. Children this age are entirely dependent on adults to provide them with appropriate and safe play opportunities.

Adults should:

- Allow exploration within strict boundaries under careful watch
- Provide reassurance to children that an adult is near and will keep them safe
- Give simple explanations about why some things are "off limits"

Children 7 to 9 years of age have increased mobility and require larger spaces for play. They should have constant or intermittent supervision during play.

Adults should:

- Be firm and consistent and promote respect for safety rules
- Take questions seriously and explain consequences of unsafe play
- Explain how and where to contact an adult quickly in case of emergency

Children 10 years of age and older require intermittent or periodic supervision, depending on play activities. Children this age are very mobile. They begin seeking new play/recreation experiences that are more complex and may pose greater risk for harm. They still do not fully understand hazards and the potential consequences of hazards.

Adults should:

- Set and enforce consistent rules and explain consequences of breaking those rules
- Explain how and where to contact an adult quickly in case of emergency

Forty percent of play-related injuries are attributed to inappropriate supervision or no supervision at all. The ABCs of supervision can provide guidance for developing safe play areas on farms (National Program for Playground Safety, www.uni.edu/playground/).

A: Anticipation

Anticipate hazards in a play area. Anticipation of hazards should be incorporated into the design of the play area. Continually monitor the area for hazards and remove them.

B: Behavior

A parent or other competent supervisor should carefully monitor children, ensuring there are no blind spots where children can hide. Note how children interact with others and how they use play equipment. Set and enforce rules for expected play behavior. "In general, the number of rules a child can remember corresponds to his/her age, i.e. a 3-year-old can remember three simple rules." However, remembering the rules does not necessarily mean he/she will follow them.

C: Context

Supervision should be modified as conditions of the play area change. When children play in a larger space or when more children are involved in play, elevate the level of supervision. Likewise, when farm activity increases, such as during busy harvest times, supervision must also increase.

How Does Play Help Children Develop?

Playing is an important means for children to develop physically, emotionally, socially and intellectually. Different types of play activities influence these attributes of development. An ideal play area blends activities matched to the developmental stages and abilities of children. When developing a safe play area on a farm, provide play structures and materials that will allow children to experience the various types of play listed below.

Playing helps children develop

- *physically*
- *emotionally*
- *socially*
- *intellectually*

Balance Play

Balance play develops body movement and control to help build gross motor skills. It also helps children improve coordination and concentration skills. Children can learn to balance on simple objects such as a building beam or log. They can practice hopping on flat stones or landscaping bricks. Balancing is further refined with riding toys, bicycles, skates, snowboards and skateboards, depending on the age and ability of the child.

Ball Play

Children increase hand-eye coordination and muscle development when throwing, kicking, rolling or catching a ball. Throwing and catching balls also introduces cooperative play, where children must take turns and/or be part of a team. Ball play fosters cooperation and interaction with the objective of achieving common goals.

Climbing Play

Climbing play allows for the development and strengthening of leg and arm muscles. Climbing also promotes and develops physical coordination, manual dexterity and hand-eye coordination. A child's environment looks very different at an elevated level. Climbing can be a challenging, energetic experience that most children find enjoyable.

Fantasy Play

The ability to pretend and imagine is an essential form of play. Fantasizing is an intellectual exercise that helps a child's mind stretch, bend and change the real world into another world. Thus, a child expands his/her imagination, creativity and independent thinking. As children's imaginations grow, they invent new uses for familiar objects, playing with them in novel ways. For example, in a child's mind, a simple structure such as a box or a small, unused building can be transformed into a school, hospital, feed store or theater stage.

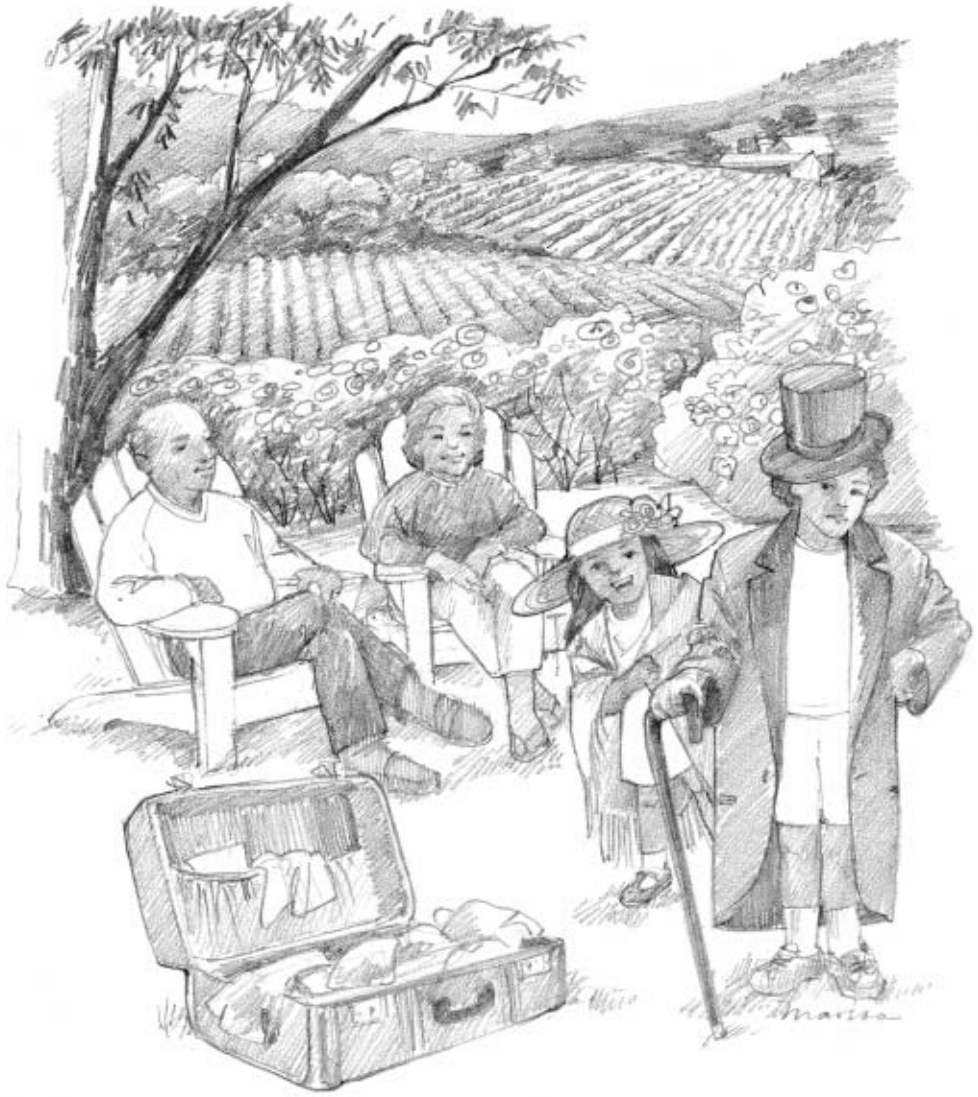
Manipulative Play

Manipulative play involves handling small objects such as building blocks or sandbox toys, playing with puzzles, children's tools, dolls, toy tractors and trucks. Manipulative play helps develop fine-muscle control, concentration and hand-eye coordination. Manipulative play requires careful thinking while actively using the hands, muscles and eyes. Nature-made items such as clay, mud, water and sand are good choices for manipulative play. Helping in the garden is another manipulative-type activity that may be enjoyable for children.

Riding Play

Riding activities can give a child a sense of exhilaration and freedom. Leg muscles, hand-eye coordination and decision-making will develop when riding a tricycle, bicycle or non-motorized scooter. Other benefits of riding include developing balance and strengthening the heart, lungs and lower-body muscles and bones. In riding play, children often begin by pushing a wheeled object, then riding it and finally graduating to a bicycle. Riding activities can become healthy pastimes, as well as transportation means, that children will never outgrow.

Fantasy play *gives a child the ability to bend, stretch and change the real world into another world, thus promoting creative and independent thinking.*



Sliding Play

Sliding play can be an exploration allowing children to enjoy play with varying heights and slopes. Different configurations such as straight slides, wavy slides, spiral slides, tube slides or water slides add to the adventure. Sliding play demonstrates the concept that "what goes up must come down" and it also helps children develop leg muscles, endurance, balance and concentration. When slides are age appropriate, they also provide children with safe and acceptable means of climbing.

Swinging Play

Swinging play develops arm muscle strength, balance and vestibular (inner ear) stimulation. Swinging contributes to cooperative play when children need to take turns or share the swings. Swinging also develops socialization skills since children often engage in conversation and singing while swinging.

What Environmental Factors Should be Considered?

Playing outdoors on farms demands special attention to hygiene, noise, air quality, clothing, sun protection, rest and nutrition.

Air Quality

Tiny dust particles and mold spores can be inhaled into the lungs. Organic dusts, those that come from a living source such as hair, bedding, grain, silage and dried urine and feces are most dangerous. These tiny particles can become airborne and easily inhaled. Children playing in areas where organic dusts are prevalent, such as animal confinement facilities, grain bins and hay lofts, can be exposed to unhealthy amounts of dusts and molds. Some of these substances can cause severe respiratory problems, both immediate and long term. Play areas should be located with as much protection as possible from farm sites where organic dusts are commonly generated.

Attire and Skin Protection

Avoid loose clothing and drawstrings on hoods and waists since they pose risks for strangulation and entanglement. Provide adequate footwear to keep feet warm, clean and dry, and to prevent slipping on play equipment surfaces. Bike helmets should be removed when children are on play equipment. Bike helmets have become entrapped when children have slipped or crawled into small openings and have caused children to be strangled.

Ideally, play spaces where children spend extended periods of time will be shaded from the sun. Special concerns are raised with overexposure to the sun's harmful rays. When playing in full or partial sun, dress children in clothing that covers their body, including a wide-brimmed hat. Apply children's recommended sunscreen (with UVA and UVB protection) to any exposed skin, such as tips of ears and back of the neck, and reapply every two hours. Keep in mind that skin is vulnerable to damaging solar rays even on cloudy days.

Hygiene

Children's play does not have to be clean or tidy. Playing in dirt or stomping through puddles can be very enjoyable! Research has shown that, within limits, exposure to dirt and microorganisms promotes development of a strong immune system. On farms, there are ample opportunities for these exposures. But farms also harbor pathogens that can lead to infections. Common pathogens include *Cryptosporidium parvum*, *Salmonella* species, *Campylobacter jejuni* and *E. coli* O157:H7. These pathogens often exist in areas where livestock and poultry manure is present or where livestock congregate. Such areas include calf hutches and livestock water tanks. Any child whose immune system is already challenged from illness or a "cold" or who has broken skin (e.g. from cuts or abrasions) needs extra protection. Children should always perform good hand washing following outdoor play on a farm.

Insects and Other Pests

West Nile virus, hantavirus, rabies, Lyme disease and Southern tick associated rash illness (STARI) are examples of diseases that may be transmitted through contact with an insect or animal to a human. Contact your county extension office or public health department or visit http://www.cdc.gov for more information on identification and prevention of insect- and animal-borne diseases specific to your region.

Noise

There are many sources of loud noise on farms such as tractors, grinders, conveyors, compressors, grain dryers, chain saws and squealing sows. Exposure to loud noise is the most common cause of permanent hearing loss. Studies show that farm workers experience some of the highest rates of noise-induced hearing loss because of repeated noise exposure that begins in childhood. Two factors contributing to hearing loss are the decibel level (loudness) and the length of exposure to noise. Protection from excessive noise exposure should begin at birth.

Decibel Chart

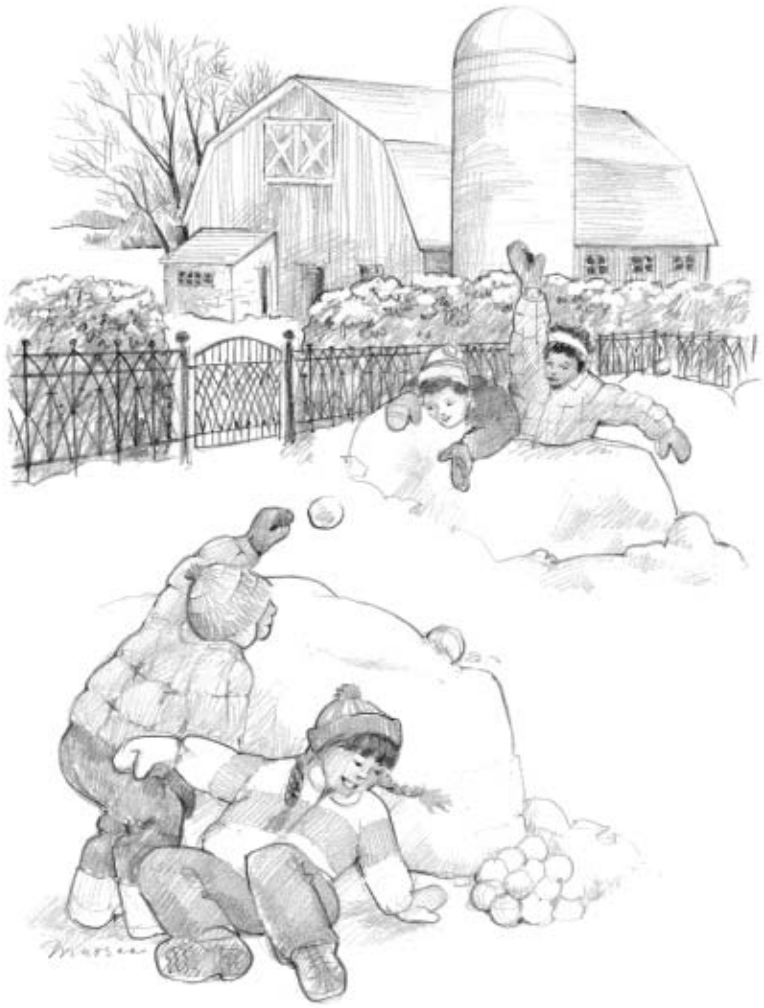
	Noise Level (decibels)	Common Sounds
Safe Zone	0	Lowest audible sound
	50	Quiet empty barn, babbling trout stream, gentle breeze
	60	Normal conversation
	70	Chicken coop, farrowing area
Danger Zone	85	Tractor or combine idling, barn cleaner, conveyor, elevator: At this decibel level, noise may begin to affect your hearing if you are exposed to it for more than 8 hours per day.
	90	Blower compressor, pneumatic wrench, harvesting silage (no cab), full throttle lawn mower: As noise gets louder the "safe" time decreases; damage can occur if you're exposed to it for more than 4 hours per day.
	100	Tractor at 80% load, squealing sows, power tools, hand-held metal grinder: 1 hour of exposure per day is the limit at this decibel level.
	110	Average walkman set above the halfway mark, full-throttle combine, 10-HP vane-axial barn fan: Anything over 15 minutes exposure per day can cause damage.
	120	Thunderclap (near), bad muffler, old chain saw: The danger is immediate
	140	Gunshot, engine backfire, dynamite blast, jet engine: Any length of exposure time is dangerous, and may actually cause ear pain.

Rest and Nutrition

Playing demands a lot of energy. Children may need a rest period and a nutritious snack during playtime. They will often benefit from extra water or fluid intake during play. Watch for excessive tiredness or irritability that may be signs of fatigue, dehydration or illness.

What are Some Specific Play Ideas that can be Modified for a Farm?

Play options on farms can be adopted from current or past experiences, by talking with playground safety professionals, reviewing parenting guidebooks and talking with friends, family and neighbors. Play areas evolve as children grow older. For example, children younger than 5 can use relatively small areas with strict boundaries such as fences or dense hedges. Older children need wider boundaries or larger zones for activities such as playing ball, riding bicycles or playing hide-and-seek. In this report, it is not possible to describe all play options for children of varying ages and abilities. A few ideas are provided below, and with creativity can be modified to match the age and abilities of different children. Keep in mind that children may use equipment or play materials in creative ways, other than what was intended!



Balls

Balls can be various sizes and made of plastic, foam or rubber to be soft upon impact. An appropriate ball size is dependent on the age and development of the child. A fence or side of building can be used to keep balls from going into unsafe lanes, water or pastures. Encourage team games with balls appropriate for ages of different children. For a small child, cut a hole through a piece of plywood as a target for a football toss exercise. For older children, add a basketball hoop or designate field space and a net for soccer. Adults must set boundaries for ball play. Rules should guide if and when children may retrieve balls that go beyond their designated play zone.

Balance Beams, Hopping Steps and Riding Paths

Use a flat log, landscape timber or building beam and place it partially into the ground for a balance beam. It is not necessary to raise the beam off the ground to help develop balancing skills. Keeping the balance beam low to the ground and providing protective surfacing will minimize injury when falls occur. Smooth rocks from the field or bricks could become a hopping path. Place them deep enough into the soil to ensure they do not wobble. Sidewalk chalk can be used for creatively decorating rocks or stepping stones in the play area.

Skating or riding a tricycle, skateboard or non-motorized scooter is developmentally important. Consider creating a designated pathway for riding. For tricycles, a short, packed fine-gravel path will work. For more vigorous riding by older children, a designated path away from work sites might be considered. Roads should be off-limits unless an adult is accompanying the child. Avoid riding when it is dark. If riding at dusk or dawn is necessary be sure to affix retro-reflective material to clothing and bicycles; and use lights on the bikes. Boundaries where older children can ride should be established. An approved bicycle helmet and other relevant protective gear should be worn when children are on bicycles, inline skates, skateboards and scooters to reduce serious injury from a fall. Remove and properly store the helmet prior to using play equipment.

Clubhouse or Fort

A small, unused building can be made into a play place for children. It can also function to allow a child an outdoor playing environment protected from weather conditions such as rain, wind, sun or cool temperatures. A cleaned calf hutch or utility storage shed might be transformed into a clubhouse, theater or playhouse. Move it to the new designated safe play area on the farm. Carefully inspect the building for chemical contamination, animal waste, holes, jagged metal or wood that can cause infection, slivers or other undesirable outcomes. (Paint manufactured before 1978 is harmful if it contains lead.) Repair, clean and paint the building before you allow children to use it. With adult supervision, children may want to paint and decorate the structure themselves. Where snow forts are made, keep them at a distance from culverts and ditches that pose risk of collapse or runover by snowmobiles.

Horizontal Ladders, Climbing Bars and Trees

On farms there are many climbing dangers. It is not appropriate for children to climb into hay lofts, up and down silo ladders or on large round hay bales. Adults should provide safe climbing options, such as children's ladders or climbing bars. Certain types of trees can provide reasonably safe climbing opportunities. Designate a sturdy tree that children 7 and older can easily maneuver. If possible, use low branches to construct a play platform for a fantasy play fort. Parents should inspect tree limbs for sufficient strength to hold the weight of a play structure and children. Anticipate how the tree fort or playhouse could be misused, construct it accordingly and set firm rules for its use. Most children like to climb but are not able to understand the risk of falling. It is very important to provide soft, protective ground surfacing of adequate depth and width under anything a child would climb.

Regional recommendations exist for play equipment structural materials and ground surfacing:

- *Wood products should not be used as playground equipment in regions where red spiders and tarantulas are common.*
- *Protective surfacing materials, when frozen, do not offer sufficient protection from a fall. Children should not be on play equipment in frozen conditions.*
- *Black ground surfacing should not be used in regions of year-round excessive heat and sun exposure.*

Sandbox

Using a large, clean tractor tire, building beams or landscape bricks, a sandbox border can be easily constructed. Fill the area with fine sand and toys such as pails, scoops, cups, trucks, sand molds and toy tractors. Depending on the child's age and adult supervision, a space for water play can also be added inside or near the sandbox. Small items that can pose a choking hazard should not be used if toddlers are to play in the sandbox. In warmer climates, inspect the sandbox prior to use for rodents, spiders and snakes. After each play session, cover the sandbox to avoid contamination by cats or birds. Dispose of water to avoid infestation by mosquitoes and pathogens.

Slide

Slides can be straight, wavy or spiral. Some are open and some are enclosed. For young children, tube slides are best. Manufactured slides are suggested because of the materials and requirements needed for a safe ladder, slide and rails. All slides need to be anchored securely in the ground. (Slides should meet ASTM F1148-00 standard, or current year.)

Slides should have:

- Steps or climbing rungs that provide stable footing
- Guardrails or protective barriers and sturdy handholds at the top of the slide for stability and to prevent children from falling off or jumping off the slide
- A platform big enough so children can sit and/or turn around
- No gaps or projections from the platform to the start of the slide that can entangle clothing
- An incline of no more than 30 degrees and curved or rounded slide edge
- Placement in a location with the shining surfaces facing away from direct sunlight
- Protective ground surfacing extending six feet out from the slide

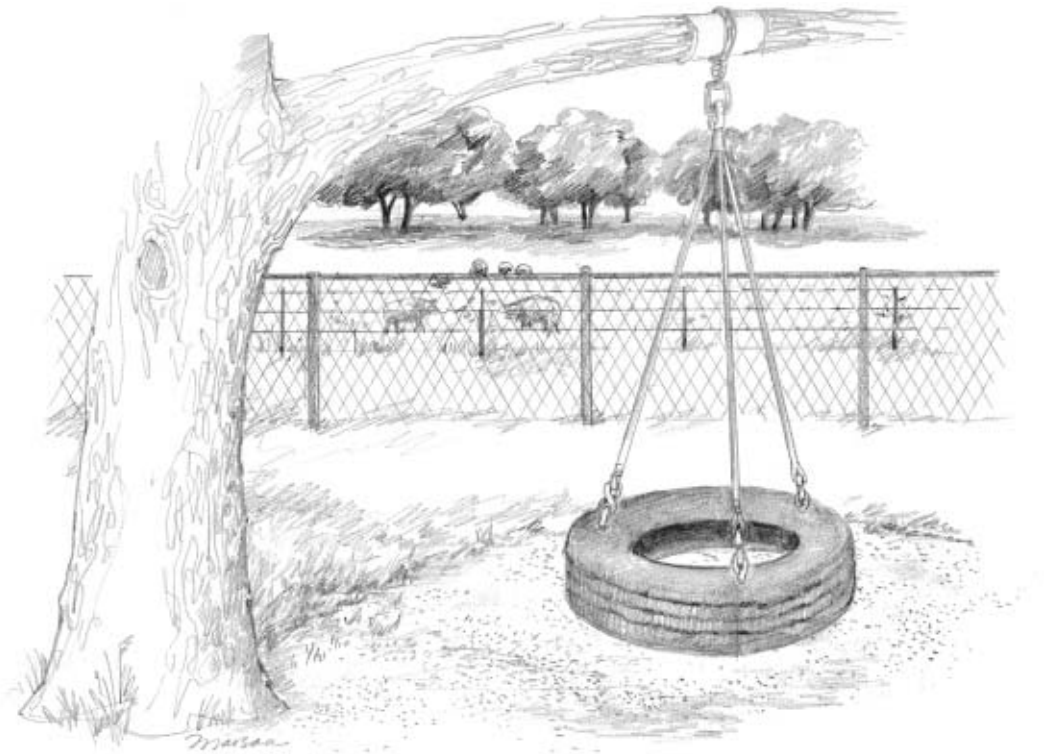
Swimming and Wading in Water

In warm weather, water activities provide important learning opportunities as well as personal pleasure. Some farms have built-in or above-ground swimming pools. Detailed manufacturer and swimming pool safety guidelines are available regarding fencing and supervision. Small, toddler-type pools should include fresh, temperate water from a clean source. Remember that a small child can drown in water that is only two inches deep. If wading in natural settings such as streams or ponds, water slippers can be worn to improve footing and prevent cuts. Be aware of contaminated water (e.g. from animal waste or field chemical run-off) and excessive sun exposure for these types of play. Constant supervision is recommended for all water activities involving children. Bodies of water used for swimming should have a rescue post. It should be painted bright yellow, placed firmly in the ground near the water and contain a nylon rope and life ring. Additional information regarding farm pond safety is available at www.abe.psu.edu/factsheets.

Swings

There are different kinds of swings for different ages. On the farm, a swing can be made using available materials and hung from a constructed cross bar or tree. Recommendations for making homemade swings address factors such as seat construction, swinging mechanisms, potential swing height and distance of potential impact of the swing against a structure, e.g. tree. Tot swings with lap straps should be used by very young children. A single, free-swinging rope swing should not be used because it could cause strangulation. Swing seats for older children should be flexible rather than stiff. Swing seats composed of a hard material (e.g. wood, metal) can cause injury if a child is struck by the seat while the swing is in motion.

If making a simple tire swing, avoid worn steel-belted tires, since they can cause injury. Suspend a tire swing using three chains or cables connected to a swivel mechanism that permits both rotation and a swinging motion in any direction. According to the U.S. Consumer Product Safety Commission, the minimum clearance between the seating surface of a tire swing and the upright(s) of the supporting structure should be 30 inches when the tire is in a position closest to the support structure. The tire should be prepared with holes to drain rainwater. (Whether homemade or purchased, swings should conform to the home playground standard: ASTM F1148-00, or current year.) Be sure the ground surfacing under the swing is sufficiently deep and wide. (Refer to Table 1, page 18 for ground surfacing information.)



How is a Play Area Prepared, Maintained and Improved?

Protective Ground Surfacing

It is inevitable that children will fall when playing. The goal is to minimize fall-related injuries by softening the impact of the body against the ground covering. Attention should be given to the type and depth of ground surfacing materials where children can fall from play equipment heights. Appropriate surfaces include loose fill such as sand, pea gravel, wood chips or wood mulch. Rubber tiles, rubber mats or poured-in-place rubber are acceptable if they meet Consumer Product Safety Commission recommendations. Rubber products are available in lighter colors so as not to absorb excessive heat from the sun. Asphalt, concrete, dirt and grass surfaces are acceptable to forms of play and recreation such as soccer, basketball and running. But these surfaces are not safe where a child may experience a fall from play equipment heights. A one-foot fall onto concrete can cause a concussion. Falling from eight feet onto dirt is comparable to a child smashing into a brick wall at 30 mph. Specific recommendations for residential and public playgrounds should also be used for play areas on farms.

Table 1. Recommended Ground Surfacing under Play Equipment

Fall Height In Feet From Which A Life Threatening Head Injury Would Not Be Expected

Type of Material (9 inches, Compressed)	Fall Height (in feet)
Double Shredded Bark Mulch	7
Wood Chips	10
Fine Sand	5
Fine (pea) Gravel	5

(Consumer Product Safety Commission, 1997)

A use zone is an extension of protective ground surfacing material from beneath a piece of play equipment. Note the table below; the use zone should extend out from the immediate fall zone of the piece of play equipment. The use zone should be free of other equipment and obstacles that children could run into or fall on top of.

Table 2. Recommended Use Zones for Play Equipment

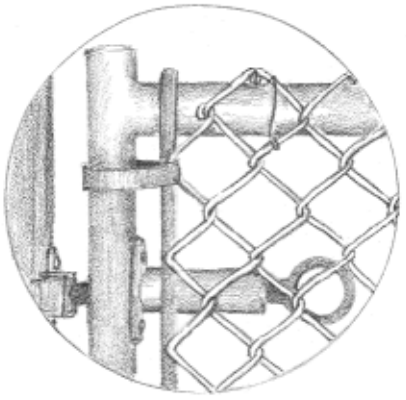
Equipment	Use Zone
Stationary Equipment	Six feet on all sides of the equipment
Slides	Six feet on all sides, four feet plus the height of slide in front of slide chute
Swings	Six feet on each side, twice the height of the swing beam in front and back of swing

(Consumer Product Safety Commission, 1997)

Equipment Components and Spacing

Many play injuries occur because of equipment hazards such as bolts and other protrusions that cause clothing to get entangled or skin to be punctured. Any protrusions greater than ⅛ inch should be removed, with the surface area smooth. Metal or wood fragments should be removed to minimize risk of slivers. Exposed metal will rust and weaken equipment. Missing parts, such as ladder rungs or anchoring bolts, also create unnecessary risks. Because time and outdoor weather can be harsh and destructive to play equipment, it is important to carefully inspect all play equipment surfaces regularly, especially following storms or a prolonged period of non-use.

The importance of sturdy fences, stable gates and latches on farm play areas cannot be overstated.



Boundaries, Fences and Gates

Boundaries and play zones should be designated prior to beginning outdoor play activities. For play zones of older children, consider the distance between the borders of an extended play zone (e.g. touch football area) and hazards (e.g. electric fence). If necessary, put up signs to mark and remind children of boundary limits.

Factors to consider with fences and strict borders include:

- Height of fence should be sufficient to keep children inside, while keeping hazards outside.
- Spacing of wooden, plastic lumber or aluminum fence slats should be less than 3½" or more than 9" to avoid head entrapment.
- Fence slats should be vertical instead of horizontal to deter children from climbing over the fence.
- Chain link fences are a good choice, offering stability and safe openings. Chain link fences should not have exposed points extending upward.
- Traditional picket fences are not recommended as the pointed fence tops could be potential head entrapment hazards and could impale a child attempting to climb over the top.
- Wooden or plastic snow fencing is not recommended because it easily breaks or splinters, and children can crawl beneath it. Snow fence is designed to halt wind-blown sand or snow, but it is not strong enough to keep children in a confined area. Snow fencing is not a permanent structure and may be easily knocked down by children.
- Barbed wire, smooth wire and woven wire (e.g. chicken wire) fencing should be avoided, as their purpose is to contain animals.
- Fences should never be used as a dual-purpose animal confinement boundary AND safe play boundary.
- Hedge and shrub rows should be thick enough to achieve the desired boundaries.

The importance of sturdy fences, stable gates and latches on farms cannot be overstated. Gates and latching mechanisms should be able to withstand weather as well as potential misuse by children. Latching mechanisms should not be accessible to younger children.

Anchoring

Play equipment should be installed to withstand the maximum anticipated forces to be exerted upon it. Large youth or several children at once might cause equipment to overturn, tip, slide or move. The risk of a serious crushing or cutting injury can be reduced by careful attention to anchoring, based on manufacturer's recommendations. Secure anchoring is a key factor in stabilizing play equipment.

Continually evaluate the features of the play area by thinking "SAFE"

***S** . . Supervision Provided*
***A** . . Age Appropriate*
***F** . . Fall Surface Suitable*
***E** . . Equipment and Surface Maintenance*

Ongoing Maintenance

Routine maintenance should include:

- Cutting grass and removing snow
- Periodically raking and replacing loose-fill ground surfacing materials
- Checking play equipment and surfaces for hazards (previously described)
- Periodically sealing, staining or painting wooden play structures to prevent deterioration
- Applying anti-rust treatment to exposed metal (use a product appropriate for playground equipment and follow manufacturer's recommendations)
- Replacing plastic equipment that shows cracks
- Regularly replacing sand and water to avoid contamination by animal wastes, pathogens or insects such as mosquitoes and fire ants
- Planning for play area additions, deletions and modifications as children grow and require greater play challenges

Upgrading and Improving the Area

In order to maximize play opportunities, while minimizing disease and injury risks, play areas should be assessed and regularly upgraded until the area is no longer needed. Observe children using the area. Ask other adult supervisors (e.g. babysitters) if the play area provides positive experiences for fun, adventure, growth and development. Talk to neighbors and friends about new ideas or options for group playing. Read about children's play in references available from the library, parent magazines or the Internet.

What are the Six Steps for Creating a Safe Play Area?

Now it's time to put your knowledge to work. These steps pull it all together.

Step 1: *Locate* a site to be developed into a safe play area. The location should provide maximum play options with minimum exposure to agricultural hazards.

Step 2: *Sketch* out the ideal play area for that site, considering ways to promote fantasy, manipulative, swinging, climbing and riding activities. Plan for modifications in play activities as children grow. (Sample sketch diagram and worksheet on pages 28 – 29.)

Step 3: *Determine* materials needed. Make, buy or adapt for different play activities. Refer to playground equipment Web sites or other resources for specific guidance related to residential play areas.

Step 4: *Build* the play area including appropriate ground surfacing, borders, fences and gates. Older children can assist with this process if they are supervised.

Step 5: *Use* the play area. Explain safety rules and post signs if needed. Observe young children, older siblings and adult supervisors as they enjoy the area. Think about immediate modifications and future changes based on how the area gets used.

Step 6: *Maintain* and improve the safe play area. Develop a routine maintenance plan that includes keeping grass mowed, checking equipment for loose or broken parts, and reviewing safety rules for visitors. Let older children help with inspection and maintenance because this enhances their ownership and reinforces the importance of telling adults about possible hazards. Make improvements as needed and modifications as children outgrow play equipment and materials.

Effective adult supervision and the developmental capabilities of children who will use the play area are at the heart of all six steps. Consider supervisory sight angles and do not rely on the play area to be a babysitter. A play area should be challenging and fun. It should nurture a child's physical, emotional, social and intellectual growth.

Our Responsibility

It is up to us, as adults, to ensure the safety of children at play. Although no farm-based play area can be guaranteed safe, we have attempted to touch on principles that can serve as a guide for building a safe-as-possible place for children to play. For more detailed information, please refer to the Resource Listing.

We encourage you to share this document with others, and to please call us with feedback at 1-800-662-6900.

Creating Safe Play Areas on Farms Resources

Professional Resources

Playground Safety

American Society for Testing and Materials (ASTM)
http://www.astm.org • F 1148-00, F 1292-99 • Phone 610-832-9585

Handbook for Public Playground Safety,
U.S. Consumer Product Safety Commission, 1997
http://www.cpsc.gov/cpscpub/pubs/325.pdf

The Dirty Dozen: Are They Hiding in your Child's Playground?
National Parks and Recreation Publications Department,
http://www.nrpa.org • Phone 703-858-2190

National Program for Playground Safety
http://www.uni.edu/playground • Phone 1-800-554-PLAY (7529)

Agricultural Health and Safety

National Children's Center for Rural and Agricultural Health and Safety
http://research.marshfieldclinic.org/children/

National Institute for Occupational Safety and Health Childhood Agricultural Injury Prevention Initiative
http://www.cdc.gov/niosh/childag/childaghome.html

Prevention of Agricultural Injuries Among Children and Adolescents Policy Statement
American Academy of Pediatrics
http://www.aap.org/policy/0065.html

Parent Resources

Playground Safety

Home Playground Safety Checklist
U.S. Consumer Product Safety Commission
http://www.cpsc.gov/cpscpub/pubs/pg1.pdf • Phone 1-800-638-2772

How can WE Provide Safe Playgrounds?
Kids Source Online
http://www.kidsource.com/kidscource/content3/safe.playgrnd.t.p.k12.safe.html

National SAFE KIDS Campaign
http://www.safekids.org

Agricultural Health and Safety

Farm Safety 4 Just Kids,
http://www.fs4jk.org • Phone 1-800-423-5437

Keep Young Children Safe on Farms,
Iowa State University Extension, PM 1563L,
http://www.extension.iastate.edu/Publications/PM1563L.pdf

Farmstead Safety: A Family Activity,
Cornell Cooperative Extension
Phone 607-255-5492

North American Guidelines for Children's Agricultural Tasks (NAGCAT)
http://www.nagcat.org/ • Phone 1-800-662-6900

Child Development
Bright Futures Project (an initiative funded by the U.S. Department of Health and Human Services under the direction of the Maternal and Child Health Bureau),
http://www.brightfutures.org/ • Phone 301-279-8890

Region-specific
USDA Cooperative State Research, Education Service (click on "state partners" to find your state extension office) • http://www.reeusda.gov

Farm and Playground Audit Resources

Harvesting Health: Health and Safety Checklist
Date of publication: 2001
Web address: http://www.marshfieldclinic.org/nfmc/harvest/safety.htm
Contact information: National Farm Medicine Center, 1-800-662-6900
Cost: free
Description: brochure

Agricultural Safety & Health: Best Management Practices
Date of publication: 2001
Web address: N/A
Contact information: Penn State University, 814-865-7157
Cost: $15
Description: CD-ROM

Agricultural Safety Audit Program
Date of publication: 1999
Web address: http://www.farmsafety.ca/
Contact information: Farm Safety Association, 519-823-5600
Cost: $15
Description: binder

Farm Hazard Inspection Checklist (A3619)
Date of publication: 1998
Web address: http://www1.uwex.edu/ces/pubs/pdf/a3619.pdf
Contact information: University of Wisconsin Extension, 1-877-947-7827
Cost: $1.50
Description: booklet

Teaming Up … A Farm Safety Walkabout for Kids
Date of Publication: 2002
Web address: http://www.fs4jk.org
Contact information: Farm Safety 4 Just Kids, 1-800-423-5437
Cost: Call for pricing
Description: Book adapted for use by families and children

Safety Report Card
Date of Publication: 1999
Web address: http://www.uni.edu/playground/report.html
Contact information: National Program for Playground Safety, 1-800-554-PLAY (7529)
Cost: Free on website; multiple copies: free
Description: Pamphlet, one page

Citations

Consumer Product Safety Commission (CPSC), Home Playground Safety Tips, Internet [on-line] http://www.cpsc.gov/CPSCPUB/PUBS/323.HTML

Myers JR, Henricks, K.J. (2001). Injuries Among Youth on Farms in the United States, 1998 (DHHS/NIOSH Publication No. 2001-154). Cincinnati, OH: National Institute for Occupational Safety and Health. Available at http://www.cdc.ogv/niosh/childag/pdfs/2001154.pdf.

National Program for Playground Safety (December 2000) Selecting Surface Materials Cedar Falls, IA: National Program for Playground Safety. Available at http://www.uni.edu/playground

Peterson L, Ewigman B, Kivlahan C. (1993). Judgments regarding appropriate child supervision to prevent injury: The role of environment and child age. Child Development, 64, 934-950.

Tinsworth D, McDonald J. (2001). Special study: injuries and deaths associated with children's playground equipment. Washington, DC: U.S. Consumer Product Safety Commission.

Safe Play Project Advisors

For More Information Contact:

National Children's Center
for Rural and Agricultural Health and Safety

National Children's Center for Rural and Agricultural Health and Safety
1000 North Oak Avenue, Marshfield, WI 54449-5790
Phone: 1-800-662-6900 or 715-389-4999
Fax: 715-389-4996
E-mail: nccrahs@mcrf.mfldclin.edu
Web site: http://research.marshfieldclinic.org/children/

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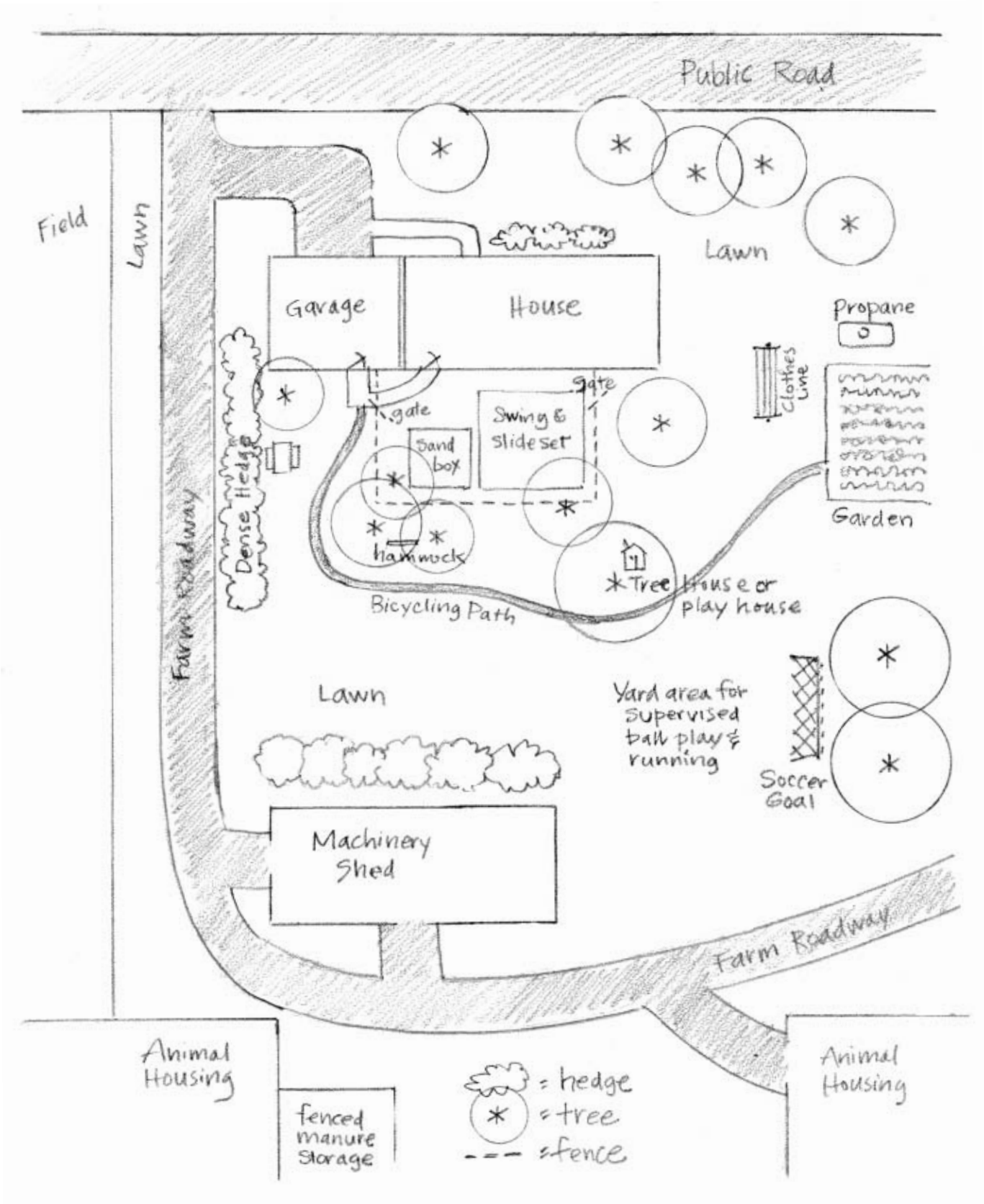
Childhood Growth and Development

Developmental	Ideas for play	Safety Issues
2 year olds		
• Able to walk • Experiments by touching, smelling and tasting • Tosses or rolls a large ball • Likes to push, pull, fill, and dump • Has difficulty sharing, is very possessive • Enjoys simple pretend play • Explores and gets into everything • Cannot sit still or play with a toy for more than a few minutes • Learns from mixing, sifting, pouring, stirring, and shaping	• Sandbox/sand toys • Low climbing objects • Big blocks and balls • Push–pull toys • Dishpan with water and cups/funnels/small water toys • Cardboard playhouse • Foot-propelled ride-on toys • Small steps to climb, barrels to crawl through, and tires to crawl over	• Provide constant supervision during play. • Requires a fence around the play area. Note the latch mechanism on the gate of a fenced-in area. Toddlers are skillful at opening doors/gates and getting into unsafe areas. • Increasing growth and mobility make it possible for them to reach unsafe heights and play with dangerous materials. • Following play, provide good hand washing.
3 year olds		
• Throws a ball overhead, kicks a ball forward and tries to catch large balls • Stands, balances, and hops on one foot • Climbs up and down a small slide by self • Pedals a tricycle well • Can step over a 6" barrier • Can solve problems if they are simple, concrete, real and immediate and if he/she wants to	• Small building or box for crawling in, coloring and decorating, and placing items in • Flat-sided log or stepping stones for balance • Large ball ring toss • Tricycles and small pedal tractors • Foam or soft rubber balls	• Provide constant supervision during play. Children are attracted to adult farming activities. Children this age do not understand hazards. • This age is not often content staying within a physical barrier, but needs one. • Note the latch mechanism on the gate of a fenced-in area. Children can open doors or gates and get into unsafe areas. • Following play, provide good hand washing.
4 year olds		
• Likes to throw, catch, and kick balls • Runs, jumps, hops, and skips around obstacles with ease • Pedals and steers a tricycle skillfully • Jumps over objects 5 – 6 inches high • Likes to gallop, turn somersaults, climb ladders and trees • Catches, bounces, and throws a ball easily • Enjoys playing alone and with other children • Has difficulty separating make-believe from real • Has vivid imagination and sometimes imaginary playmates • Enjoys drama and role playing	• Simple games such as Duck Duck Goose and Ring Around the Rosy • Bicycle course or hopping path • Dress-up clothes, play dough, colored chalk, and puppets • Play wheelbarrow, hand tools and work table, garden tools, camp tools, or kitchen center • Construction toys and play tractors for the sandbox	• Provide constant supervision during play. Children are attracted to adult farming activities. Children this age do not understand hazards. • A physical barrier is still an important safety measure. • Children can open doors/gates and get into unsafe areas. • Following play, provide good hand washing. • Provide safety helmets for children on bicycles, tricycles and skates.

Developmental	Ideas for play	Safety Issues
5 year olds		
• Runs, gallops, and tumbles; is learning to skip • Throws balls overhead and can catch bounced balls • May begin bicycle riding with training wheels • Balances on either foot for 5 – 10 seconds • Invents games with simple rules • Still confuses fantasy with reality • Is project minded – plans buildings, play scenarios, drawings	• Fort or playhouse • Puppets, dolls, dress-up clothes, play house or tree house • Riding course for use with tricycles or skates • Child-size camp equipment or toy tools • Jump rope	• Provide constant supervision during play. Children are attracted to adult farming activities. Children this age do not understand hazards. • Set and enforce rules on the boundaries of play areas. • Instruct children to stay away from work areas. Instruct farm workers to return a child to a safe area if the child enters a work area. • A physical barrier is still an important safety measure. • Children can open doors/gates and get into unsafe areas. • Provide safety helmets for children on bicycles, tricycles and skates. • Following play, provide good hand washing
6 - 8 year olds		
• Catches small balls • Enjoys activities with other children and team sports • Is often competitive with siblings • Is interested in games with rules and actions, but lacks skill • Interested in rules and rituals • Enjoys activities alone as well as with others • Enjoys reading as a pastime • Enjoys dramatic play • Is curious about nature, things and people • Wants to know how things work • Likes to build things	• Throwing at targets, running, jumping rope, tumbling • A small building transformed to a play house, school, or farm store • Bicycles, roller skates/in-line skates, pogo sticks, snowboards or skis • Kite flying, team ball sports, and magic sets	• Provide constant supervision during play. Children are attracted to adult farming activities. Children this age do not understand hazards. • Be sure the designated play zone is free from as many farm hazards as possible. • Set and enforce rules on the boundaries of play areas. • Instruct children to stay away from work areas of the farm. Instruct farm workers to return a child to a safe area if the child enters a work area. • Provide safety helmets for children on bicycles and skates. • Following play, provide good hand washing.
9 - 10 year olds		
• Body strength and hand dexterity increase • Coordination and reaction time improve • Interest in competitive sports increase • Girls are generally as much as 2 years ahead of boys in physical maturity • Hobbies and how-to projects become an interest • Organized activities such as clubs, secret groups, and codes become of interest • Specialized motor skills develop	• Games of strategy • Team and individual sports, music, dancing, and handicrafts • Outdoor “camping” experiences in the backyard • Snowshoeing and cross-country skiing in the yard or in a nearby field • Woodworking activities, model cars, outdoor puppet shows, and archery activities	• Provide intermittent to periodic supervision during play. Children are attracted to adult farming activities. Children this age do not fully understand hazards and their consequences. • Set and enforce rules on the boundaries of play areas. • Instruct children to stay away from work areas. Instruct farm workers to return a child to a safe area if the child enters a work area. • Following play, provide good hand washing. • Provide safety helmets for children on bicycles and skates

Play Area Design Worksheet Sample



Worksheet: Draft Your Play Area Design

What they're saying about...

Creating Safe Play Areas on Farms

"…provides clear guidance, and the information is very useful."

Peter Dueppengiesser, Dairy Farmer, NY

"The *National Program for Playground Safety* endorses *Creating Safe Play Areas on Farms*. The basic principles of playground safety … are accurately integrated within this document. These principles are extremely important whether on a public playground or a farm playground."

Donna Thompson, Ph.D., Director,
National Program for Playground Safety, IA

"…a one-of-a-kind resource providing guidance on the use of residential playground products and nature-made play areas in the farm environment."

Teri Hendy, Chair of ASTM Subcommittee on
Industry Standards for Residential Playground Equipment

"Children are too often exposed to agricultural work hazards. Parents and farm owners need to understand the risks associated with farming and provide a safe alternative to those exposures. This document will help."

Marilyn Adams, Spokesperson, Founder and President,
Farm Safety 4 Just Kids, IA

"Farm children are the future of farming. Protecting them and creating strong safety awareness will help them when they are the adults operating the farms in the future. I suggest that farm owners use *Creating Safe Play Areas on Farms* as a guide to protect young children from farm hazards."

Bruce Stone, Safety Manager, Virginia Farm Bureau, VA

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ADDRESS SERVICE REQUESTED