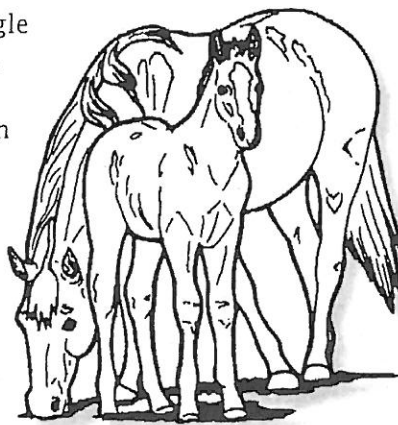


Fences for Horses

Whether it's a backyard pen for a single horse or an array of paddocks for a large equestrian center, a well-designed and well-maintained horse fence is an asset. While many people marvel at attractive fences around pastures and paddocks, appearance should be of secondary concern to an informed owner. A fence should be designed to protect horses, people, and property. A good fence should provide safety as well as be affordable, durable, and functional. There is no ideal fence that is best for all horse owners or applications.



Selection of appropriate fences varies according to individual needs or the potential uses around the farm or barn. This publication provides an overview of the factors that should be considered before you install a horse fence.

Safety

A properly installed and maintained fence should provide safety for both horses and people. Horses can be secured behind a fence and kept away from vehicles or other equipment. Fences can be used to keep people away from horses that may be considered dangerous. Fences can also prevent horses from causing damage to other property should they get away from their handlers or riders.

Several safety factors should be considered before a fence is installed. First, a horse has limited eyesight, and a fence should be highly visible, especially to running or startled animals. Second, it must be solid enough to repel a running horse, yet flexible enough to prevent injury. There should be no sharp edges or projections on the fence, such as nail heads or wire ends, that can cut the horse. There should be no openings in the fence or spaces between boards, rails, or wire that are big enough for a head or hoof to pass through but small enough to trap the head or hoof. Finally, the fence must be tall enough to discourage jumping. Perimeter fences should be 5 feet high, while dividing fences should be 4½ to 5 feet high. Taller fences may be needed in some cases, such as for small paddocks or stallion pens.

Affordability

A fence can be a major investment. In addition to the cost of materials, you should consider the cost of maintenance. Some fences may have a high initial cost but a low maintenance cost. Conversely, some have a lower initial cost but a high maintenance cost. As a farm owner, you should consider affordability both initially and in the long term and then choose the fence that offers the best features within your acceptable price range. Another factor is whether you have the time and expertise to save money by installing the fence yourself or whether you need to hire a professional contractor. Improperly installed fences will be less effective and will result in higher maintenance expenses as well.

Durability

How long a fence lasts depends on the type of material it is made of, the construction, how well it is maintained, the weather exposure, and the size and aggressiveness of the horses contained. Even good fences can fall into disrepair in just a few months if problems are not identified and corrected in time. For instance, crowded conditions in an overstocked pasture or paddock can lead to damage from the horses' constantly pushing on the fence.

Be sure to choose materials that are well suited to specific applications. Weather conditions can play a critical role in the life of a fence. Fences well suited for some climates may not be advisable in others. Check manufacturers' recommendations and independent product test results. If possible, talk to other horse owners who are currently using the product to determine how well it holds up in a particular climate.

Functionality

The best materials and the best intentions are worthless if the fence is not properly planned. First, identify and locate the major areas you want to fence and decide what the fence should accomplish. Carefully determine where to place walking and vehicle gates. Design a pasture and paddock system that will centralize access to the barn, work areas, and feed storage, as shown in Figure 1. The centralized location will improve efficiency and

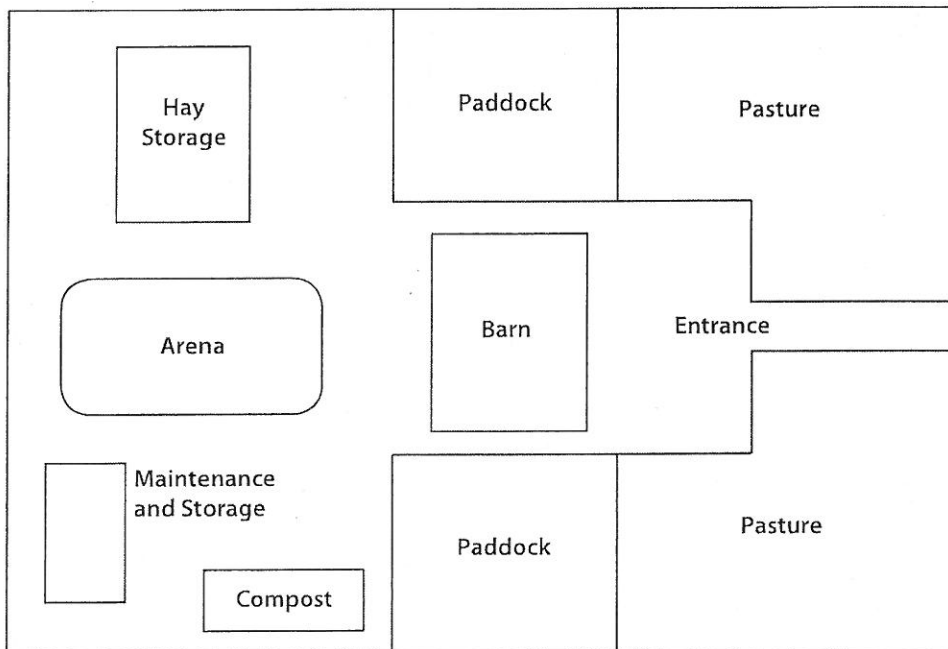


Figure 1. Barn and fence layout.

management and will reduce labor and operating expenses.

Also consider future expansion. Fences designed with long-term goals in mind won't have to be torn down and done over if expansions are planned.

Appearance

The appearance of the fence is the final consideration. An attractive and well-maintained fence promotes pride in ownership, increases property

value, and gives an impression of professionalism. However, safety, affordability, durability, and functionality are all more important factors to consider. One approach that would combine looks with utility would be to place more expensive, eye-appealing fences in the well-traveled areas and less expensive, utilitarian fences in other areas. However, the more attractive fences must also be functional. Never let appearance alone lead you to choose a fence that doesn't meet your needs.

Fencing materials

The most common fencing materials are wood, metal, plastic, and concrete. Some fencing systems combine more than one material. Examine the pros and cons of all materials before making a choice.

Wood is one of the most popular materials available for horse fences. Wood can be used for posts, braces, boards, or rails. Wood will naturally decay when exposed

to ground contact or weather; therefore, pressure-treated or naturally decay-resistant species, such as cypress, black locust, or red cedar, should be used. Preservatives for pressure treatment fall into three categories: waterborne preservatives, creosote, and pentachlorophenol. These products greatly reduce the rate of decay of lumber if the recommended treatment level is selected and used. For example, wood is rated for above ground, soil and freshwater contact, permanent wood foundation, and saltwater use. Each use requires a different amount of

preservative to be retained in the wood, based on exposure to soil and moisture. For example, wood rated for above ground use has less preservative in it than wood rated for use as a permanent foundation. Waterborne preservatives include copper chrome arsenate (CCA), alkaline copper quat (ACQ), and copper azole (CA). CCA-treated wood products are being phased out for residential uses, but they may still be available for agricultural applications, such as fence posts and rails. Wood treated with ACQ or CA can be used in

place of CCA-treated lumber for posts and boards. However, ACQ and CA treatments are more corrosive. Fasteners used with this lumber should be hot-dipped galvanized or stainless steel.

Creosote is still available for posts and boards used in fences or other exterior applications. Wood treated with creosote should not be used in the interiors of farm buildings where there may be direct contact with horses that may crib (bite) or lick the wood. Pentachlorophenol can be used for lumber, posts, and poles; however, it is not widely available. Treated wood of any type should not be used in an application where it will be in direct contact with feed, hay, or drinking water. Check the manufacturer's use guidelines for more details.

Metal can be used for posts, rails, and wire and as hardware to secure other fencing materials. Steel is the preferred material because of its strength and durability. Steel used for posts or rails should be galvanized to prevent rust or painted with an appropriate coating. Steel used for fasteners, such as nails, staples, or screws, should be galvanized for rust prevention. Stainless steel fasteners can be used if needed for added corrosion protection, but they are more expensive. Wire fencing is typically galvanized steel, but stainless steel and aluminum are used as well. Galvanized steel wire offers good strength and corrosion resistance at a reasonable cost.

Plastic used for fencing should be weather resistant and stable in sunlight. Polyethylene (PE), polyvinyl chloride (PVC), and fiberglass are the most common materials. Plastic tends to become brittle as it gets cold, and it may soften if it gets extremely hot. Plastic fencing should be formulated to resist these extremes. Some plastic fencing is intended for residential application only. This type of fencing uses thinner material and is not suitable for containing horses. Be sure to select fencing designed for farm or horse uses. If in doubt, request test data from the manufacturer for the fencing materials you are considering.

Concrete can be used for posts or rails or to secure other types of posts in the ground. When used for posts and rails, it is reinforced with steel bars. Concrete is strong and durable but expensive if used as a complete fence. Minimum strength requirements for concrete should be 4,000 pounds per square inch.

Plastic-coated wood is also available for fencing. This is pressure-treated wood enclosed in PVC or PE to provide weather resistance—a product that combines the strength of wood with the durability and low maintenance of plastic.

Plastic-coated wire is another popular choice. Galvanized wire is coated with plastic to improve visibility for horses. This wire can be single strand or wire rail. The wire rail design uses two or three strands of wire lain side by side and spaced 1 to 5 inches apart. When molded with the polymer, it forms a thin fencing strip or rail that is strong and flexible, yet wide enough to be visible.

Fence styles

One of the most common and popular types of wooden fences is the **post and board** design. Posts are typically set at 8-foot intervals, and 16-foot horizontal boards are attached to the posts. Designs may vary, but most fences of this type use three, four, or five planks. The joints are staggered between alternating posts to improve strength. Boards are fastened to the posts with galvanized or stainless steel nails or screws. Recommended lumber sizes are given in Table 1.

Table 1. Lumber Sizes.

Fence Height	Pastures			Rings and Paddocks	
	Line Posts	Corner Posts	Boards	Posts	Boards
4½'	4' x 4' x 7½'	6' x 6' x 7½'	1' x 6' x 16'		
5'	4' x 4' x 8'	6' x 6' x 8'	1' x 6' x 16'	6' x 6' x 8'	2' x 6' x 12'
6'	5' x 5' x 9'	6' x 6' x 9'	1' x 8' x 16'	6' x 6' x 9'	2' x 8' x 12'

Another popular style is the **post and rail**. Posts are drilled and cut so that rails may be inserted through the holes. The rails are easy to replace if damaged. The posts are made from pressure-treated wood or PVC. Rails may also be pressure-treated lumber or PVC. Decay-resistant lumber may be selected if preferred.

Pipe fences are extremely strong and durable. Galvanized steel pipe is set in concrete for the perimeter posts of the fence. Pipe rails are then welded in place as desired. Alternatively, portable sections of fence can be constructed and attached to wood or metal posts. This type of fence is strong, durable, and low maintenance, but it also is usually very expensive to install. Further, pipe fences are very rigid, and a horse that runs into one may be injured.

Wire mesh or **woven wire** fencing comes in

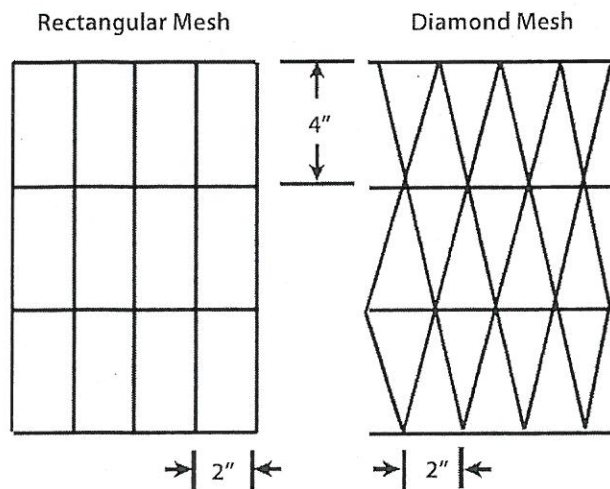


Figure 2. Wire mesh patterns.

many styles or designs. The traditional wire mesh styles used for field fencing have large rectangular openings between the wires. These openings are smaller near the ground and larger at the top. Large openings may prove hazardous for horses if they get a hoof caught in the wire. For horses, wire fencing with smaller, vertically oriented grids available in diamond, triangular, or rectangular shapes woven together with horizontal and vertical wires is available (Figure 2). The horizontal wires provide strength to maintain tension, while the vertical wires offer support and create the pattern. The fence will spring back to its original shape and tension if a horse pushes against it. These patterns are well suited to horses.

Wire-mesh fencing is among the safest available. The small mesh openings minimize the risk of injury to horses, and they keep dogs and other animals out of the horse enclosure. Wire mesh is stapled to wood posts and stretched tightly to form a secure fence. A board across the top of the fence can be added to improve visibility for the horse and to protect the fence from sagging as the horse pushes against it.

High-tensile-strength wire fences consist of several strands of smooth, high-tensile-strength wire stretched tightly between line and corner posts. Corner posts must be anchored and braced to support the high-tension loading. This type of fence is relatively inexpensive, strong, and durable. However, the wire is difficult for a horse to see, if not properly marked, and may cause injury if a horse is entangled in it. **Polymer-coated wire** is an alternative to the smooth galvanized wire. Single-strand wire coated with plastic is as strong as the smooth wire but has the added

advantage of higher visibility, thereby reducing chances of injury. **Polymer-coated wire rail** consists of two or more strands of wire spaced 1 to 5 inches apart. The wire is encased in the polymer web so that it resembles a board or rail. The resulting fence has the appearance of a post and board fence, but is flexible enough to give with pressure. High-tensile-wire fences should be provided with tension adjusters to compensate for stretching.

Electric fences can be used as permanent or temporary fencing. Electric fences are not advised for use as a perimeter fence to enclose the entire facility. If a high-tensile-strength wire fence is used, one or more strands of the wire are mounted to the posts with insulators, and these strands are electrified to deliver a mild shock if the horse touches it. Another alternative is the electric polymer-tape fence. In this material, several strands of fine stainless steel wire are woven into a polymer tape. The width of the tape is 1½ inches or less. The tape offers much better visibility than the thin wire electric fence. Depending on the number and weave of the steel wire, the poly tape can be used as either a temporary or permanent fence. Be sure to select a material that is durable and suitable for exposure to sunlight. Consult the manufacturer's guidelines to determine the recommended life span of the fence. Electric fence chargers should be selected specifically for horses. Check the manufacturer's ratings to determine the correct type of charger and whether it will cover the length of wire being energized.

Design and installation

A good fencing project starts with a clear understanding of what you need the fence to accomplish. Locate the major working areas of your property, and think about how you move people, horses, and equipment among them. Then you can lay out the boundaries of your fence.

Fences may be used to define pastures, paddocks, runs, turn-out areas, or riding arenas. Fences should be used to separate horses in different production stages, *i.e.*, bred mares separated from open mares, growing horses separated from mature horses. Fences can also be used to separate people areas from horse areas. A fence that encloses the perimeter of the facility, particularly the barn area, could prove to be a wise investment. Pedestrian gates can be placed where needed, and vehicle or horse gates can be conveniently located as well.

First consider the outer perimeter of the property to be enclosed. A perimeter fence en-

hances security for horse and property. Horses occasionally get away from handlers or riders. A perimeter fence may be the only thing between the horse and a heavy traveled road or a nearby subdivision. A gate placed at the entrance to the property could be locked for added security if the barn were unattended. The gate could also quickly be closed in the event of an emergency. Manual or automatic gate openers could be employed.

Once the outer perimeter is established, plan the interior fences for pastures, paddocks, runs, a riding arena, or any other area you want to separate. Be sure to leave ample room for vehicle traffic into and out of the area.

Once you have the plan developed, locate the fence line and corners on your property. Corner posts should be set in concrete and braced appropriately for the type of fence to be built. Wire fences that must be tensioned will require solidly braced corners. Follow the fence manufacturer's recommendations closely for corner post and brace installation. Line posts may be set in concrete or tamped earth as desired for strength. Wooden corner posts should be set in concrete. Dig a hole 3 feet deep that is wider at the bottom than the top. A layer of gravel in the bottom aids drainage. Center the post and tamp about six inches of soil around the base of the post. Next fill the hole with concrete to within 6 inches of the surface. Once the concrete has set, finish filling the hole with tamped soil.

Fences such as high tensile wire and woven wire should be braced to strengthen the fence and provide proper anchoring. Figure 3 illustrates a typical brace design using a horizontal

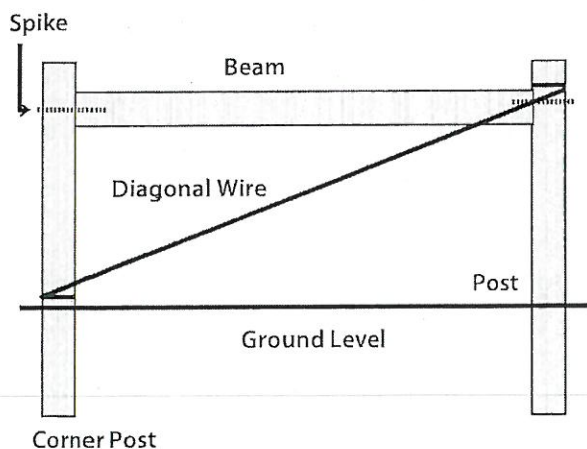


Figure 3. Fence bracing.

beam and diagonal tensioning wire. Bracing is recommended at corners, in wet areas, and near gates.

Determine the size and type of gates to be installed. Locate the gates carefully. Horses tend to gather around gates. If a gate is placed in a corner, horses may be trapped by more aggressive members of the herd. Bear in mind that larger gates require much more support, which may be provided by a guide wire or bracing. Stronger gates will be needed in areas of frequent use or heavy pressure from the horses.

If nonelectric metal wire, wire mesh, woven wire, or cable fencing is used, it must be properly grounded to protect the horses from lightning. If the fence is supported by metal posts, the posts are considered adequate lightning protection. If wood, plastic, or concrete posts are used, grounding electrodes must be installed. In normal dry soil, the grounding electrodes must be no more than 150 feet apart. In normally moist or damp soils, the grounding electrodes must be no more than 300 feet apart. Further, the metal fencing must be broken at maximum intervals of 1,000 feet by wooden panels, gates, or other insulating barriers.

Cost and durability

Estimating fence costs can be difficult because prices change over time. However, Table 2 on the next page will help show the relative cost and durability of different types of fences. Bear in mind that a higher initial investment in quality fencing may save money in the long run due to lower maintenance costs and longevity.

Summary

Choosing a fence for a horse operation is a major decision and a major investment. Factors as safety, durability, cost, and appearance affect the decision. Careful planning is necessary to determine the fence location and the objectives the fence must satisfy. Decisions must be reached on the type of fence, fencing materials, and fencing layout. The initial cost of some fences may be high, but lower maintenance costs over the long term may prove to be economical enough to offset the cost. Select a quality fence at a price you can afford. If you install and maintain it correctly, the fence will give you years of reliable service.

Table 2. Fence Costs and Longevity.

<i>Type of Fence</i>	<i>Initial Cost (\$/Linear ft^{1,2})</i>	<i>Annual Maintenance Cost, (\$/ft³)</i>	<i>Expected Life (Years³)</i>
Wood Post and Board	High	High	15-20
Wood Post and Rail	High	High	10-15
Polymer Post and Rail	High	Low	20-30
Steel Pipe	High	Low	15-20
Polymer-Coated Wood	High	Low	20-25
High-Tension Wire	Low	Moderate	20
Polymer-Coated Wire Rail	Moderate	Moderate	20-25
Woven Wire	Moderate	Low	20-25
Electric Wire	Low	Moderate	20
Electric Tape	Low	Moderate	10

¹ Cost range based on retail prices in year 2000.

² Cost estimates do not include installation.

³ Based on proper installation and maintenance in accordance with manufacturer's recommendations.

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Prepared by
G. T. Roberson
Extension Specialist, Biological and Agricultural Engineering
and
R. A. Mowrey
Extension Specialist, Extension Horse Husbandry

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