

# ESTABLISHING AND MANAGING IRRIGATED PASTURE FOR HORSES



Irrigated pasture not only provides forage for horses but provides an exercise area with sunshine and fresh air. The greatest disadvantage is the seasonal forage which is highly productive in the summer and less productive in the winter.

Before establishing a horse pasture, do some planning. Consider its feasibility in view of stocking needs and land availability, and look at the cost and availability of equipment and materials to establish and maintain it. This leaflet will serve as a guide in these decisions.

## **Pasture Establishment**

If flood irrigation is to be used on a proposed pasture, the land must be leveled and graded with a slope of 0.1 to 0.4 foot of grade per 100 feet of length. The length

and width of the checks or irrigation runs depend on the soil type, head of water, and slope in the direction of water flow. A water supply of 10 gallons of water per minute per acre is desirable. Length and width of checks should be regulated so they can be irrigated and drained adequately. Water should not stand on a pasture for over 24 hours. Ponding will invite mosquito breeding.

A sprinkler irrigation system requires little or no surface grading but is more expensive initially than border irrigation systems (except where extensive land leveling has been involved; see U.C. Agricultural Sciences Leaflet No. 2875, *Irrigation Costs*). Sprinkler irrigation has the advantage where the water supply is limited or expensive, the soil shallow or sandy, or the

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terrain rough or steep. A sprinkler system is more convenient because it requires less operator time and labor. However, sprinklers are difficult to manage in areas of strong wind. They may require protective barriers to prevent damage by horses or to prevent horse injury. Some owners use old tires for this purpose.

Once the irrigation and drainage system is completed and tested, a seedbed can be prepared. Moisten the soil to a 10-inch depth, then plow or chisel the land and follow with discing, harrowing, and rolling. It is important that these land preparation steps be conducted to reduce soil compaction, break up plowpans, and produce a fine, firm, clod-free seedbed.

If fertilizer is to be applied, it should be incorporated near the end of seedbed preparation, just before planting. It is often desirable to wait and apply fertilizer, especially nitrogen, after the pasture is growing and weeds are under control.

Seed can be planted with a seed drill or by hand-broadcasting, taking care not to place the seed more than  $\frac{1}{4}$  inch deep. Broadcasting requires care to uniformly spread the seed. Spreading half the seed in one direction and half in the other direction usually insures adequate placement. Follow broadcast seeding with ring rolling to cover and press the seed into the ground.

Selecting the right seeding mix depends on how the pasture is to be used and the kind of stock that will use it. The person who owns horses for show, racing, or breeding may want the pasture used mainly as a place for exercise and exhibition. An exercise pasture does not require a large area since it supplies only a small portion of the animals' feed. The working

rancher, on the other hand, may depend on the irrigated pasture to furnish most of the horses' feed. Therefore, forage pastures must be much larger than exercise pastures if they are to furnish most of the energy requirements for horses. In many areas where land prices make grazing impractical, horse owners are often better off to acquire a small area where they can exercise their horses and purchase feed.

If the main use of the pasture is to provide an exercise area, then a grass sod pasture is best. In southern San Joaquin Valley and the southern desert regions of the state, bermudagrass is commonly used for horse pasture. This plant produces a good sod that resists trampling. Bermudagrass commonly invades pastures throughout the coastal and valley areas of the state. In the cooler northern counties, tall fescue produces the best sod pasture.

A mixture of grasses and legumes can make a productive horse pasture. If sheep or cattle are going to use the pasture also, then care should be taken so it is not dominated by bloat-causing legumes such as Ladino clover. (Legumes such as strawberry clover and the trefoils are less likely to cause bloat.) Many horse owners exclude clover from their horse pastures because horses prefer grass and make little or no use of clover. Some horse owners believe that under certain circumstances clover may cause founder. However, recent research indicates that founder is produced by high carbohydrate rations rather than high protein feeds such as legume forage. Regardless, legumes still should comprise no more than one-third of the seeding mixture by weight. Alfalfa planted on irrigation borders can improve the quality and

carrying capacity of grass pastures. Your local farm advisor can give specific seeding recommendations for your area.

Horse owners who desire a highly productive, all grass pasture should plant forage-type bermudagrasses at the rate of 10 pounds per acre in the warm southern areas of the state. In the cooler areas, a mixture of tall fescue, orchardgrass, and perennial ryegrass at the rate of 6 to 7 pounds per acre of each species should be seeded in the spring or fall. Total seeding rates of 15 to 25 pounds of seed per acre are common. Rates as high as 25 pounds per acre are sometimes recommended especially in situations where poor seed distribution and poor seedling establishment may occur. Finally, make sure legume seeds have been properly inoculated with nitrogen-fixing microorganisms before planting.

Seeding at the beginning of the rainy season before November when temperatures are not too cold, or at the end of the rainy season in February or March before warm weather begins, is intended to allow establishment without irrigation. Sprinkler systems can be used when rainfall is inadequate by sprinkling about ½ inch of water every two to three days on the newly-seeded pasture. Flood irrigation of a newly seeded pasture should be avoided if at all possible, and should not be used regularly until seedlings have been up for about two weeks.

Weeds should be mowed when they reach 6 inches to open the stand to sunlight. Grazing should be delayed until the grass is about 10 inches high.

### **Pasture Irrigation**

Irrigation amounts and frequency will

vary depending on weather, soil type, rooting depths, and presence of subsoil impervious layers. During hot summer periods, 3 inches of water every one to two weeks may be required to maintain a productive pasture. Irrigation amount and frequency will be lower in cooler coastal regions and in spring and fall. However, it is important to start spring irrigation before the soil dries out. In the fall, irrigation should be continued until the rainy season begins.

Sandy soils have low water-holding capacities and therefore require more frequent irrigation, while clay soils are not porous, hold water longer and require less frequent irrigation. Loam soils generally have water-holding capacities intermediate to sandy and clay soils.

Soil moisture can be determined by using a soil tube, soil auger, or shovel. Soil moisture should be checked throughout the rooting zone of the species in the pasture. Clovers can use moisture down to a depth of about 2 feet, while grasses extract water down to 3 to 4 feet, and alfalfa may extract water down to 6 feet if soil conditions do not impede root growth. Remember that subsurface hardpans can restrict the rooting depths of pasture plants and the movement of water. Adequate soil moisture should be maintained throughout the entire rooting zone of all the plants in the pasture. This requires irrigation often enough to keep the shallow-rooted clovers growing vigorously and deep enough for the grass roots. For clovers try to keep the top 6 inches of the soil from becoming completely dry.

To reduce the chances of mosquito and fly problems and invasion of water-loving weeds, standing water should drain in about 24 hours. Runoff should drain to a

properly sloped, weed-free ditch to further reduce mosquito and horse fly production sources.

Stock should be excluded from the pasture during irrigation and until the surface dries. Wet soils are compacted by trampling, thus retarding root growth and water infiltration. This is a major source of pasture abuse that is easily avoided by corraling animals or moving them to a drier pasture.

### **Pasture Fertilization**

Fertilization can vastly improve pasture production. However, the first post-seeding fertilization should be delayed until the seeded pasture species are growing vigorously and can compete with the weeds. Then, take care to graze off all the forage produced, or mow the pasture periodically so that coarse material of low nutritive value does not accumulate.

Pasture plants can get nitrogen from legumes or from fertilizer. If your pasture is all grass and you want more forage production, applications of nitrogen fertilizer will generally increase growth. During periods of rapid growth grass pastures will use up a single nitrogen application in about 30 to 40 days, therefore, it is common to apply 30 to 40 pounds of nitrogen per acre every 30 days, to get higher productivity.

If about half of the pasture is legumes, and if water, phosphorus, and sulfur are adequate, then nitrogen-fixation by the legumes will supply adequate nitrogen. In fact, adding nitrogen in this situation would increase grass and reduce clover production. Where phosphorus and/or sulfur are deficient, addition of phosphorus and/or sulfur will cause legume production to increase. Consult your local farm ad-

visor about local soil deficiencies and fertilizer requirements for your situation.

Additional soil fertility can be gained by spreading manure piles periodically. This also reduces the coarse, unpalatable growth that develops around them.

### **Weed Control**

Weed control is best accomplished by mowing, maintaining a healthy pasture, proper drainage, and avoiding soil compaction. Avoid standing water that commonly leads to invasion of water-loving weeds such as watergrass, dock, and sedges. On the other hand, high spots that are inadequately irrigated encourage weeds, such as yellow starthistle, which is poisonous to horses.

Herbicides can also be very effective in controlling weeds, but their costs must be weighed against benefits gained. Chemicals are best used to spot-treat concentrations of weeds rather than for spraying the entire grazing area. Recommendations for weed control should be obtained from your local farm advisor. Read the product label to determine precautions required to prevent injury to livestock or wildlife, including fish. A permit from your County Agricultural Commissioner may be required to purchase some herbicides.

### **Animal Management**

During a 6- to 8-month growing season, one acre of established, well-managed irrigated pasture should supply enough feed for one to two 1,000-pound horses. Because horses are physically hard on a pasture, the stand should be well-sodded, which means it will be years before a new pasture can tolerate maximum stocking. Horses can damage pastures rapidly because of their active behavior and their

ability to graze pasture plants more closely than other classes of livestock.

Rotating horses and other stock between several pastures reduces overall grazing, improves pasture productivity, allows for irrigation and fertilization when the stock are not in the pasture, and helps control internal parasites. The frequency of rotation depends on the species of plants used and their vigor. Low-growing plants such as trefoil, clover, and bluegrass can be grazed often or continuously down to 2 to 4 inches in height. In contrast, tall-growing pasture species such as tall fescue, alfalfa, and orchardgrass can be grazed closely but not often. Alfalfa and alfalfa-grass mixtures should be permitted to attain 8 to 18 inches height before grazing. This may require five to six weeks rest between grazings. Where tall and low-growing species are mixed, shorten the rest to three to four weeks. This allows the low-growing plants to compete with the taller species and avoid being crowded out.

In large pastures, movement of salt, water and feed may be necessary to insure uniform grazing.

Building a corral or small pen with shelter adjacent to the pasture keeps the horse dry during inclement weather and reduces pasture traffic. It also provides a place for feeding and watering the horse outside of the pasture.

Selection of pasture fencing materials depends on the type, temperament, and value of the horses, location of the fence, topography of the pasture, and budget of the horse owner. The outside fence should be sturdy and at least 5½ feet high. Where wire is used, smooth wire is preferable to barbed wire. Railroad ties make good

corner posts and should be sturdily braced. Gates should be at corners. Because some horses chew wood, steel posts may help prevent this vice. Wood, close-mesh woven wire, cable and belting are other good fencing materials. Farm building plans may be obtained through your farm advisor or from U.C. Agricultural Engineering Extension, Davis, CA 94616.

### Supplemental Feeding

Forage quality changes through the grazing season. Spring growth is highly nutritious but its high moisture content may have a laxative effect on grazing animals. Feeding dry hay can offset this.

Horse pastures are often overstocked and therefore often need to be supplemented with other feed, particularly when the grass is dormant. Alfalfa hay containing some grass is a common supplemental feed. According to the National Research Council, a horse on hay alone will eat about 1.5 percent of its weight daily. Thus, a 1,000-pound idle horse, or one used for light or occasional work, needs 15 pounds of hay daily or one 100-pound bale every 6 to 7 days. The approximate weight of your horse can be determined from the following table:

Heart girth (inches)	Weight (pounds)
54	492
56	531
58	596
60	664
62	722
64	785
66	852
68	902
70	985
72	1065
74	1220
76	1265

Mares that are nursing foals, and horses used for moderate to hard work, should receive a grain mix in addition to their hay and/or pasture. Foals should also be creepfed a high energy and protein mix split between morning and evening feedings. (See U.C. Agricultural Sciences Priced Publication No. 4005 *Feed Requirements of the Light Horse*.) Sudden changes of feed should be avoided.

Plants used in irrigated pastures must be hardy to survive and produce feed. However, plants having this characteristic usually do not supply high quality forage. Also, the capacity of the young horse to eat and digest forage is limited in relation to its nutritional need for growth. This can result in a nutritional deficiency that retards growth from time of weaning to about two years of age. Normal growth can usually be assured by feeding one-half pound of grain mix per 100 pounds of body weight daily, in addition to the hay and/or pasture. A young horse (less than three years old) will probably also need a protein supplement, such as soybean meal, depending on the amount of legumes in the pasture.

Supplemental feed should be put in feeders at ground level. A worn out tractor tire makes a satisfactory, safe and inexpensive feeder for concentrates. Always have fresh water and iodized or trace mineralized salt available.

### **Animal Health**

Horses are susceptible to a number of different stomach and intestinal worms. Infestations are more severe on irrigated pastures because the concentration of livestock causes greater worm egg buildup and the moist conditions favor longer viability of the infective eggs. Do not let horses drink from stagnant water holes. If

pastures cannot be leveled for proper drainage, fence off low spots or swampy areas (see U.C. Agricultural Sciences Priced Publication No. 4006, *The Common Parasites of Horses*, and No. 2338, *The Light Horse*).

Follow a regular program of de-worming horses in cooperation with a veterinarian. Professional knowledge of different worm parasites present, general ranch operation, seasonal changes, and places where horses may be exposed to infestation (fairs, shows, trail rides) is essential in deciding when and how often to give horses medication.

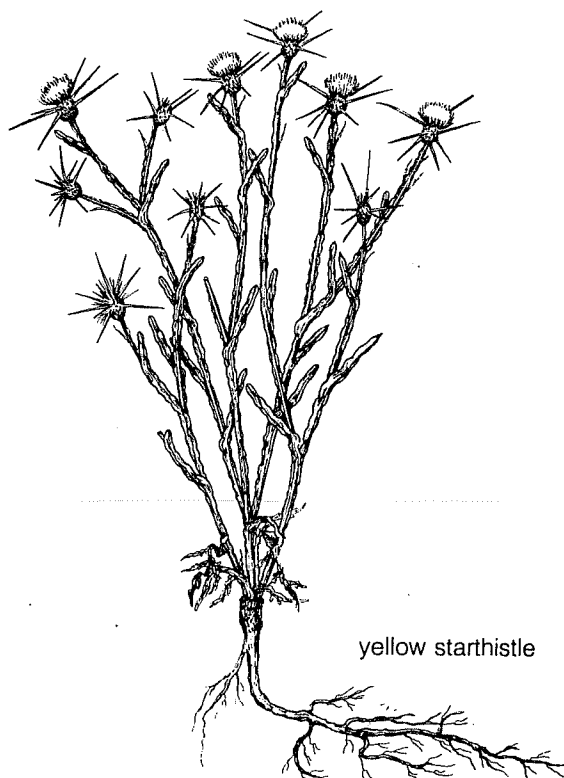
The potential for fly production is not as great on pasture as it is when horses are stabled, but it can occur. If fly numbers increase, look for areas of wet manure buildup such as in corral and fence corners. Irrigation water or water trough leaks into areas of manure buildup can cause ideal fly breeding conditions. If fly breeding areas are found, eliminate the problem through manure and water management.

Horses on pasture should have their hooves trimmed about every two months. If a farrier is not available, obtain instruction on trimming from an experienced horseshoer, buy the correct tools, and do the job yourself.

If you have a mare that is going to foal, separate her from other horses at least two weeks before her due date. Other horses will sometimes play with and injure the young foal. The gestation period of the horse averages 333 days (but can range from 323 to 365 days). Write the breeding date and due date on a permanent record. (Calendars are not permanent; they get thrown away at the end of the year.)

## Common Poisonous Plants

Various native and introduced plants such as fiddleneck, yellow starthistle, oleander, and nightshade are poisonous (see U.C. Agricultural Sciences Priced Publication No. 4005, *Feed Requirements of the Light Horse*). Your county farm advisor or agricultural commissioner can advise you of poisonous plants in your area. Horses usually avoid poisonous plants unless they are forced to eat them for lack of other feed. However, some horses acquire a taste for certain toxic plants, such as yellow starthistle and locoweed, and will deliberately consume them.



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