



Pastures need management attention to produce large amounts of good quality forage throughout the growing season. However, most horse owners may be surprised by the amount of management it takes to achieve quality pastures. This publication is designed to help horse owners manage their pasture throughout the grazing season.

STOCKING RATE

The stocking rate is the total number of pasture acres available per horse. Generally speaking, a stocking rate of 2 acres per 1000 lb horse is recommended if the pasture is expected to provide most of the feed and nutrition for the horse during the growing season; eg. For 5 horses averaging 1000 lb, 10 acres of well managed pasture is needed. However, there is a range in the stocking rate which is determined by soil type, environmental conditions and management practices. If well-managed pasture on fertile soil is provided mainly for exercise and supplemental grazing, only 1 acre per horse may be needed. With less management and less productive soil, as much as 5 acres per horse may be needed. In general, higher stocking rates will require more hay supplementation.

SACRIFICE AREA

A sacrifice area is a designated paddock or area where horses are kept during times when adequate forage is not present or the pasture is resting or too wet (Figure 1). The sacrifice area usually turns into dirt and is also called a dry lot or holding area. The sacrifice paddock is also commonly used for hay and grain feeding and usually contains the horse's water source and shelter. Sizes of sacrifice areas vary, but should be large enough for comfortable, long-term housing of horses.

PASTURE ENTRY

In spring, keep horses off pastures until the ground firms

Figure 1. Typical Sacrifice Area



up and the grass has a chance to get growing. Once the grass is 6 inches tall, start easing the horses onto the grass in 15 to 30 minute increments. Gradually increase the amount of time in the pastures over the course of several weeks.

Begin grazing when tall cool-season forages (eg. smooth brome grass and orchard grass) are 8-10" tall and short cool-season forages (eg. Kentucky bluegrass and perennial ryegrass) are 4-6" tall. Remove horses from the pasture when tall cool season forages are 3-4" tall and short cool season forages are 1-2" in height, or you have exceeded your grazing time limit (Table 1). Adequate rest and recovery periods are essential to maintaining desirable pasture plants with good productivity.

ROTATIONAL GRAZING

Rotational grazing is a practice that, if done correctly, can help increase your pasture productivity. Rotational grazing is dividing the pasture area into several small paddocks. When a horse finds an area in the pasture that has the type of forage they prefer, they will usually keep on grazing this area and disregard the rest of the pasture. Because of the continuous grazing, the preferred species or areas become weak and can't compete with less desirable plants such as weeds.

Rotationally grazing your pasture should also allow

appropriate rest periods. In fact, the key to pasture productivity with any rotational grazing design is providing adequate rest periods for pasture recovery and being flexible depending on the season. For example, in spring, only 2 weeks of rest per paddock may be needed, in summer 6 weeks may be needed, and in fall 4 weeks may be needed. Generally speaking, grass growth potential is high in spring, low in summer, and moderate in fall. With fewer paddocks, or during the summer months, horses may need to be held in a sacrifice paddock since it is highly unlikely a paddock can sustain 14 to 42 days of continuous grazing without becoming over grazed. In these situations hay supplementation will most likely be needed. Remember, resting the pasture is essential and allows the forages to store carbohydrates (energy) in their roots and regrow vigorously.

Rotational grazing does not need to be complicated. Table 1 give guidelines for rotational grazing based on 2, 3, 4, or 5 paddocks. In some cases (early in spring with 5 paddocks) horses may need to be rotated before the pasture has been adequately grazed. In this case, horse owners may hay the paddock, or mow the forage to a height of approximately 4”.

Rotational grazing also contributes to better manure management. Instead of one or two big dropping areas, there are several smaller ones throughout the pasture. Smaller manure piles dry and break up faster, reducing fly numbers and odor. Dragging the paddock helps break up the piles, dries out the manure, and distributes nutrients back to the pasture. Dragging should be done when horses are rotated out of the paddock.

FENCING OPTIONS

Good, safe fences are essential for rotational grazing. Horse owners should follow the BASIC rules, which are Budget, Appearance, Safety, Installation and Containment. The external fence (around the entire pasture) should be permanent and safe (i.e. no barbed wire). Electric fencing

is generally the most economical, especially for internal subdivisions. Consult a reputable dealer with experience with horse fencing for more information.

PASTURES AND LAMINITIS

Founder, also known as laminitis, is an inflammation or swelling of the laminae or tissues that connects the hoof wall to the coffin bone. Most vets say a horse has “foundered” when they have signs of pain in their feet, increased digital pulses and swelling in the lamina that may potentially lead to rotation or sinking of the coffin bone.

The most common laminitis relates to nutrition and diet. Rapid intake of starches or fructans (a sugar) stored in pasture plants can cause laminitis. Fructans are the primary reserve carbohydrate stored in cool season grasses like orchardgrass, brome grass, and timothy. Sugar content is highest when grass is in the vegetative state (early spring and during re-growth); during periods of cool nights and warm sunny days (fall or early spring); after a hard freeze; and during drought conditions. Careful pasture management by horse owners with sensitive horses is essential. Good pasture management entails not overgrazing, limiting grazing time, and/or using a grazing muzzle.

Grazing should also be limited during times of environmental stress on plants such as drought. It is important not to over graze pastures as the lowest stems often contain the highest amount of sugar. Avoid grazing on pastures with lots of seed heads as they also contain high amounts of sugar. Introducing horses to lush spring pasture gradually will reduce the chance of laminitis.

WEED CONTROL

Weed control in pastures is a challenge for most horse owners. Weeds are generally less palatable, less nutritious, lower yielding, and are less dependable as a forage supply for

horses. Good grazing management will reduce weed problems, but often not completely eliminate them since horses are such selective grazers. Some common pasture weeds are also poisonous or harmful (i.e. white snakeroot and hoary alyssum) or on the Minnesota Noxious Weed List (i.e. thistles). There are three types of weeds; annuals, biennials and perennials. Annuals complete their life cycle in one growing season. Biennials require two growing seasons to complete their life cycle, and perennials can live for three or more years.

Mowing pastures to a height of 4” three to four times a year, or after horses are rotated out of a paddock, will keep most annual weeds from becoming a problem. Mowing also helps to even out the pasture area and stimulate vegetative regrowth. Make sure to mow weeds at or before flowering to prevent new seeds from entering the soil.

Apply herbicides selectively and carefully, and only if necessary. Applying herbicides in the spring or summer will help control annual and biennial weeds, however, mowing should be adequate for effective control. For effective perennial weed control, keep mowing throughout the growing season to prevent seeds from forming and to keep plants in the vegetative stage. Apply herbicides in early fall (around September 1st) for the most effect control of perennials.

If you have a mixed pasture (legumes like alfalfa or red clover and grasses), there are no herbicides you can use to selectively control the weed and not injure or kill the legumes or grasses. Mowing is the only weed control option for a mixed pasture. If you would like a mixed pasture, once weeds are under control, legumes can be over seeded.

Remember, a well managed pasture will out compete most weed species.

SOIL TESTING AND FERTILIZING

Take a soil sample to determine if your pasture needs additional fertilizer. If it does, split the fertilizer in thirds and apply the fertilizer on major summer holidays (Memorial Day, 4th of July and Labor Day). Split

applications of nitrogen (N) fertilizer provide the best yield distribution over the season.

Often, only nitrogen is needed in pastures since manure provides quite a bit of phosphorus (P) and Minnesota soils tend to be naturally higher in P and potassium (K). But if the field has been neglected or hayed, some K and P may be needed. Lime should be applied if soil pH is below 6.0. If you want alfalfa or other legumes in your pastures, lime the soil to pH 6.8. A soil test will give you information needed to manage your soil fertility and pH. To obtain a soil test kits, and for further instructions, go to: www.soiltest.coafes.umn.edu

Only spread manure on your pastures if you have more than 2 acres per horse. Spreading additional manure (other than what the horse naturally leaves behind) on your pasture can result in greater chances of parasite exposure.

SEEDING BARE OR OVERGRAZED AREAS

August 15th to September 15th is the best time of year to seed or reseed your pastures (usually adequate moisture, less weed competition, and cool, desirable weather conditions). Common grass species used are orchardgrass, timothy, and smooth brome grass. Turf-type lawn grasses like Kentucky bluegrass can be used for higher traffic areas and serve as a good base for your pasture. Low-endophyte forage-type tall fescues (also known as endophyte free fescue) can be used, but be sure to not use turf-type tall fescues in horse pastures as harmful fungal endophytes can be present that can cause reproductive problems and dry gangrene. Italian ryegrass can be used as a nurse crop (2-3 lb/ac) or seeded alone (25-35 lb/ac). Its high seedling vigor makes it easy to establish and compete with weeds.

Spring is also an acceptable time of year if you missed the fall deadline. April 1st to May 15th is the best time in the spring to reseed your pastures. If you are seeding into existing pastures, typically rates are 12-15 pounds per acre. Make sure you keep horses off newly seeded pastures until the grasses are well established and you have mowed 2 – 3 times. A no-till drill works best, but

Table 1. Rotational grazing paddock designs for horses based on 2, 3, 4, or 5 paddocks.

Number of paddocks	Spring		Summer		Fall	
	Days of grazing per paddock	Days rested per paddock	Days of grazing per paddock	Days rested per paddock	Days grazing per paddock	Days rested per paddock
2	14	14	42	42	28	28
3	7	14	21	42	14	28
4	5	15	14	42	10	30
5	4	16	11	44	7	28

roughing up the area and broadcasting seeding can work, too. Keep in the mind, weed emergence usually increases with increased soil disturbance.

Example of Mixed Pasture Seeding

Smooth brome	8-10 lb/ac
Orchardgrass	3-5 lb/ac
Alfalfa	3 lb/ac
Red clover	2-3 lb/ac

Example of Grass Pasture Seeding

Smooth brome	8-10 lb/ac
Orchardgrass	3-5 lb/ac
Timothy	3-5 lb/ac

Over- or Inter-Seeding into Grass Pasture

Red Clover	5 lb/ac
White Clover	2 lb/ac
Ryegrass	10 lb/ac

Figure 2. Mixed pasture seeding of red clover and grass.



LATE FALL AND WINTER CARE

Some deciduous leaves can be deadly after a frost. Leaves that tend to be most toxic are those of red maple and cherry trees. Identify all such seasonally toxic trees in your pasture and keep horses from their fallen or frost damaged leaves for at least 30 days. Legumes like alfalfa, red clover, and white clover have higher bloat potential after frost. Nitrate toxicity can also be an issue after

frost with some nitrate-accumulating plants. Generally, this is only a concern with some grass species where high nitrogen has been used and with some weeds that are known to be nitrate accumulators like lambsquarter and pigweed. It is recommended that horse owners wait up to a week after a killing frost before grazing alfalfa or clover-rich pastures or area where nitrate toxicity is a concern.

It is not recommended to keep horses on pasture over winter. There is minimal nutritional value in the dormant/dead grass and legumes. Hoof traffic and continuous grazing can cause considerable damage, which can result in weak plants or bare spots in the pasture the following spring and summer. During winter months, keep horses in a sacrifice area where they are fed hay, have water and shelter.

CONCLUSION

Following the below eight points will help boost your pasture productivity:

1. Do not overstock or overgraze
2. Have, and use if necessary, a sacrifice paddock
3. Rotationally graze
4. Each pasture paddock needs 2 - 6 weeks of rest depending on the season (Table 1)
5. Soils test every 3 years
6. Fertilize if needed (1-3 x per year)
7. Mow and drag after each rotation
8. Control weeds

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