

# Pastures for Horses

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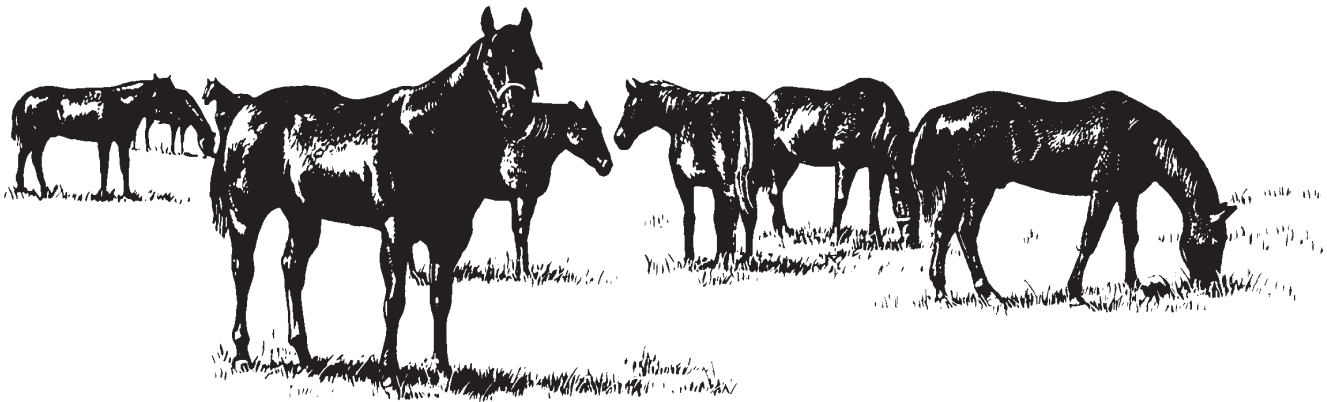
**G**ood pasture management practices can easily double the total forage produced in a field. Good management can also greatly extend the period over which adequate pasture is available for horses without the need for additional hay. For example, horses grazing on a poorly managed grass pasture will require supplemental feed throughout the growing season; the same acreage of a well-managed pasture can provide sufficient feed for most of the same period (figure 1). Adding a legume will increase forage production, reducing the need to purchase hay and grain. Additionally, horses grazing on well-managed pastures will remain in better condition and have improved health compared to those grazing on poorly managed pastures. This publication describes how to improve existing pastures, how to seed new pastures, and suggests strategies for getting the most potential out of pastures for your horses.

## Usage—nutrition or exercise paddock?

The first decision is whether the paddock is going to be used primarily for exercise or for nutrition (and exercise). Most horses benefit from exercise. Free exercise reduces behavior and respiratory problems, and improves bone growth. This need can be met on a relatively small, well-drained lot regardless of animal numbers.

If the pasture is to serve as a feed source, then the stocking rate (animals/acre) must be in a range so that the pasture can provide adequate tonnage of good nutritional quality forage. Horses generally eat 1 to 2% of their body weight daily. Thus, a 1000-lb horse requires about 10 to 20 lb of forage per day. The recommended stocking rate is 1000 lb of horse(s) per 2 to 4 acres. It makes no difference whether this is one 1000-lb horse or two 500-lb horses. Heavier stocking rates (more than one 1000-lb horse per acre) cause excessive trampling and reduced forage growth and quality. Trampled pastures will not be able to meet the animals' forage needs. As a result, animal condition will suffer unless supplemental feed is provided. Conversely, when stocking rates are below the recommended level (1000-lb horse on more than 2 acres), the horses will not be able to keep up with pasture growth. If pasture grasses are allowed to mature, they will provide low quality forage. The pasture will also become weedy and, possibly, overgrown with brush.

The recommended stocking rate is for average to good pasture under normal conditions. You may need to reduce the stocking rate if the horse has high nutritional requirements because it is working or pregnant, or if pasture productivity is reduced due to low soil fertility, drought, or low-yielding species such as Kentucky bluegrass.



## Establishing the pasture

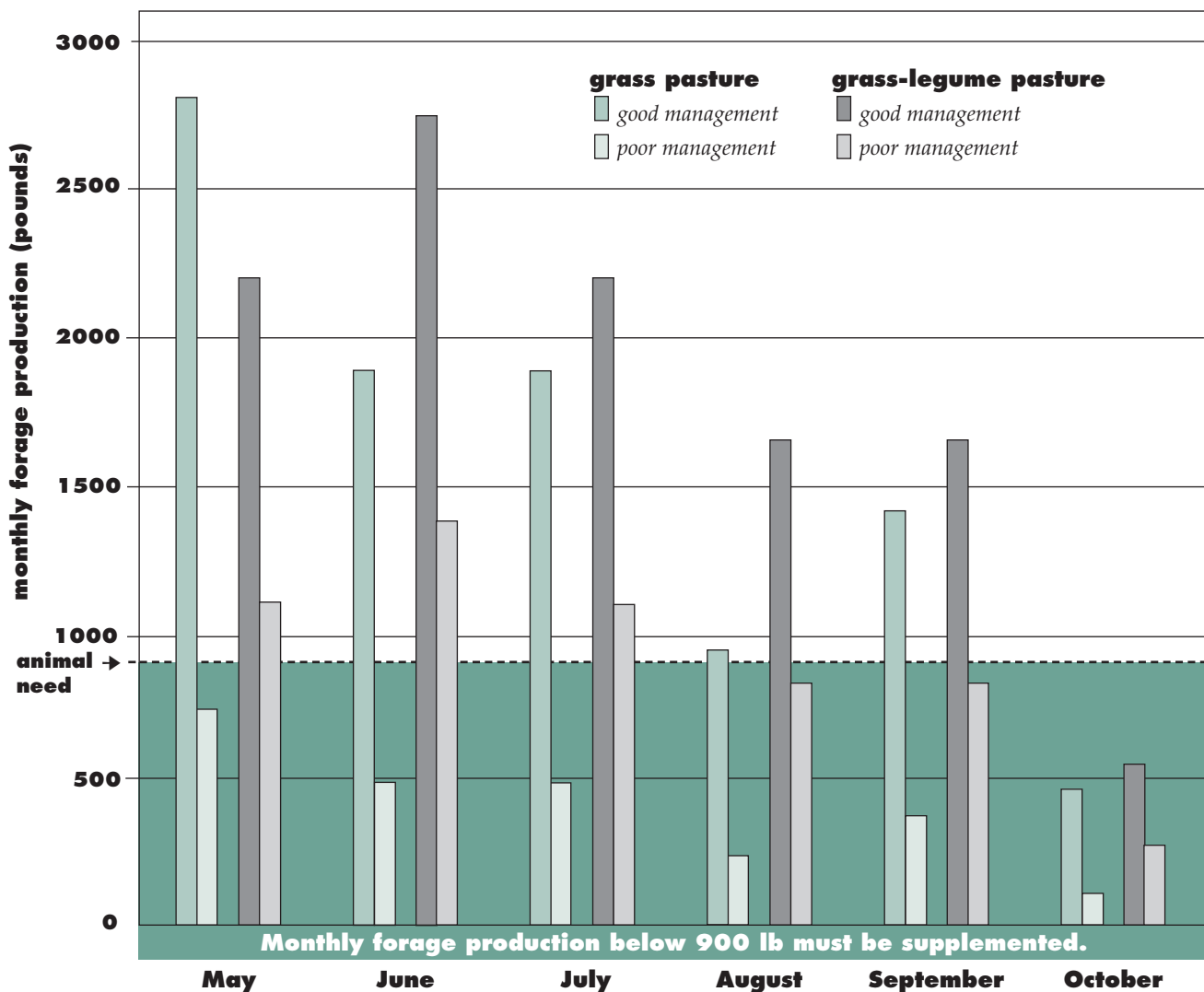
**Soil testing, the first step.** Whether you plan to improve an existing pasture or seed a new pasture, you should first test soil pH (acidity) and fertility. If the pasture soil is not at optimum fertility and pH, any seeding has a low chance of success. Divide the pasture into areas that have uniform soil color and texture as well as similar cropping histories. Sample each area randomly using a spade or soil sampling tube, taking samples to a depth of 6 inches. Place samples in a clean plastic bucket (minerals from metal buckets or materials such as feed can contaminate the sample). Do not take samples near roads, field

borders, or from distinctly different areas such as sandy ridges or eroded spots. Collect samples from several sites within a uniform area, combine samples, and send to a soil testing laboratory. Request analysis of soil pH, phosphorus, and potassium.

The soil test recommendations will tell you how much lime is needed to adjust the soil pH to the optimum level. Lime reacts slowly, so incorporate it 3 to 6 months before seeding. For best legume stands, incorporate lime in the fall—or earlier—and seed the next spring. If soil pH is above 5.8, lime and other fertilizer may be incorporated with tillage immediately before seeding. If soil pH is below 5.8 and you're unable to incorporate the

**Figure 1. Monthly forage production in 2-acre grass and grass-legume pastures.**

*A 2-acre pasture needs to produce at least 900 lb of forage per month to feed one 1000-lb horse; feed must be supplemented when production falls below that level.*



lime 3 to 6 months before seeding, then incorporate the lime at seeding and interseed the legume later.

### Improving (renovating) an existing pasture.

Most commonly, a pasture already has a grass (and weed) cover. In these cases, the most economical and environmentally sound practice is to renovate the pasture rather than to plow it and start over. The principle is to control the weeds first and then interseed a legume into the existing grass.

Begin renovation by controlling serious weed problems. The most common serious weed problems in pastures are thistles and brush. These can be controlled by repeated mowing or with a timely application of an appropriate herbicide (table 1). The key word is “timely.” Applying an appropriate herbicide when weeds are at the wrong stage of growth will often give poor weed control. Follow label instructions for rate, timing, and other restriction information.

Test the soil for the pasture as described earlier. Fertilize as recommended on the soil test results. If lime is recommended and you intend to seed

legumes, apply a fine grade of lime to the soil surface and/or use a legume that grows in a lower soil pH (more acid soil). Alfalfa has an optimum soil pH of 6.8, red clover performs best at 6.2, and birdsfoot trefoil and other clovers prefer 6.0.

There are two methods for seeding legumes into grass sod, frost seeding and no-till drill. Frost seeding is the practice of broadcasting legume seed on the pasture surface in the spring after the snow is gone but while the ground is still frozen. The fall before seeding, graze the pasture short so that broadcast seed can fall on the soil surface. In early spring (mid-March or as soon as the snow is gone) broadcast red clover at 2 to 4 lb/a or birdsfoot trefoil at 4 lb/a. Frost seeding is inexpensive and increases the percentage of legume in the pasture but does not provide uniform mixtures of grass and legume. The success of this method depends on cool, moist spring periods.

Seeding using a no-till drill places the seed directly into the soil. This method is more expensive than frost seeding but is more reliable and provides more uniform grass-legumes mixtures. Use the same seeding rate as for frost seeding.

**Table 1. Herbicides for controlling weeds in horse pasture.** Check current labels before using herbicides.

Weed	Herbicide	Timing	Horse pasture restrictions
Broadleaf weeds	Weedmaster	Treat actively growing weeds.	Do not graze for 7 days.
Brush	Spike	Treat when ground is not frozen. Treated brush may take several months to die.	No grazing restriction. All vegetation in the treated area will be killed; nothing will grow on treated soil for 2 years.
Canada thistle, multiflora rose, musk thistle, others	Ally	Treat when thistle is 6 inches tall and when multiflora rose has leafed out.	Will kill legumes. No grazing restriction.
Canada thistle, most brush species, others	Crossbow	Treat when weeds have leafed out and are rapidly growing.	No grazing restriction if less than 2 gal/a is applied.
Canada thistle	Stinger	Treat thistle at prebud stage.	No grazing restriction.
Canada thistle, quackgrass, others	Roundup	Treat actively growing weeds.	Do not graze for 14 days.
Thistle, broadleaf weeds	2,4-D	Treat when annual broadleaves are seedlings. Treat actively growing biennials, like bull and musk thistle, in the rosette stage. Treat actively growing perennials, like Canada thistle, in bud to early flowering stage.	Do not graze for 7 days after application

Adapted from Field Crops Pest Management in Wisconsin (A3646)

**Table 2. Pasture seeding mixtures (select a column based on water drainage)**

Mixture	—Well-drained soils—				—Less well-drained soils—					Poorly drained	
	1	2	3	4	5	6	7	8	9	10	11
<b>Long-lived grass</b>	seeding rate, lb/ acre										
Kentucky bluegrass						10					
Orchardgrass	2-4		2-4				2-4				
Reed canarygrass											6
Sm. bromegrass		3-6		3-6	3-6				3-6		
Timothy					2-4			3-4	2-4	2-4	
<b>Legume</b>											
Alfalfa	4-6	4-6									
Alsike clover									3		
Birdsfoot trefoil										6	
Ladino clover									1		
Red clover			4-6	3-6	6		6	6			
White clover						4					
<b>Cover crop</b>											
Annual ryegrass	2	2	2	2	2	2	2	2	2	2	2

**Table 3. Characteristics of pasture mixtures listed in table 2**

Mixture	Appearance	Yield	Traffic
<b>1</b>	excellent	excellent	fair
<b>2</b>	fair	excellent	good
<b>3</b>	excellent	excellent	fair
<b>4</b>	fair	excellent	good
<b>5</b>	fair	excellent	good
<b>6</b>	excellent	fair	excellent
<b>7</b>	excellent	excellent	fair
<b>8</b>	fair	good	fair
<b>9</b>	fair	good	fair
<b>10</b>	fair	good	fair
<b>11</b>	fair	excellent	excellent

When planting a legume into a grass pasture, it is important to keep the existing grass sod from crowding out newly seeded legumes. To reduce competition, graze or mow the grass when the legume seedlings are emerging (1 to 2 weeks after seeding). This early grazing will not hurt the new seedlings if horses are on the pasture for only 1 to 2 days. The pasture should be grazed again whenever the grasses shade the newly seeded legumes (8 to 10 inches tall).

**Seeding a new pasture.** In most situations some pasture sod is present and the best recommendation is to renovate the existing pasture rather than to till the area and reseed. However, where a row crop field is being converted to pasture or where pasture sod does not exist for some other reason, it may be necessary to seed new pastures.

Prepare the field for seeding by plowing or chiseling the field and then further tilling to provide a smooth, clod-free surface. Seeding may be either in the spring (late April to early May in southern Wisconsin and 2 to 3 weeks later in central and northern Wisconsin) or in late summer (during the first 3 weeks of August in central and southern Wisconsin).

All seeding mixtures should have three components:

1. One or more long-lived **grasses**,
2. a **legume**, and
3. a **cover crop**, such as annual ryegrass, that emerges rapidly to prevent erosion and to control weeds.

Table 2 lists recommended seeding mixtures and table 3 describes the characteristics of each mixture. A cover crop is always recommended. It should be a species that germinates rapidly to hold

the soil in place and keep weeds down until the other species are established. The cover crop most often recommended is annual ryegrass, which should be included in the mixture at 2 lb/a. Seeding ryegrass at higher rates may cause it to crowd out the other components of the pasture mixture. The long-lived grass may be Kentucky bluegrass where a good sod is desired with attractive appearance. The alternatives are timothy or smooth brome grass or more commonly a mixture of the two where higher tonnage of forage production is desired. The legume should be white clover where Kentucky bluegrass is seeded or alsike clover in wet areas. Red clover is most commonly used with timothy or smooth brome grass, although birdsfoot trefoil is sometimes used on wetter soils and alfalfa (4 lb/a) can be used on well-drained soils.

For uniform seeding, place the grass (except bluegrass) and legume seeds in separate boxes on the seeder or seed with separate passes over the field. If seed is mixed together, the larger grass seeds separate from the legume seeds as the seeder bounces across the field. This results in more legume in some areas and more grass in others. Seed should be drilled ¼- to ½-inch deep or seeded with a Brillion seeder. A drill seeder should have press wheels after the disc openers to pack the soil after the seed is placed in it. Providing a firm seedbed improves germination through good seed-soil contact. Do not till the field with a disc or harrow after seeding.

Pastures can be grazed in the seeding year when growth is 12 inches tall. It is best to graze intensively for 1 to 2 days and then to rest the pasture. Do not leave horses on newly seeded pasture when soil is wet. In the second year, after the sod has developed, horses can remain on wet pastures for 1 to 2 days.



## Managing horse pasture

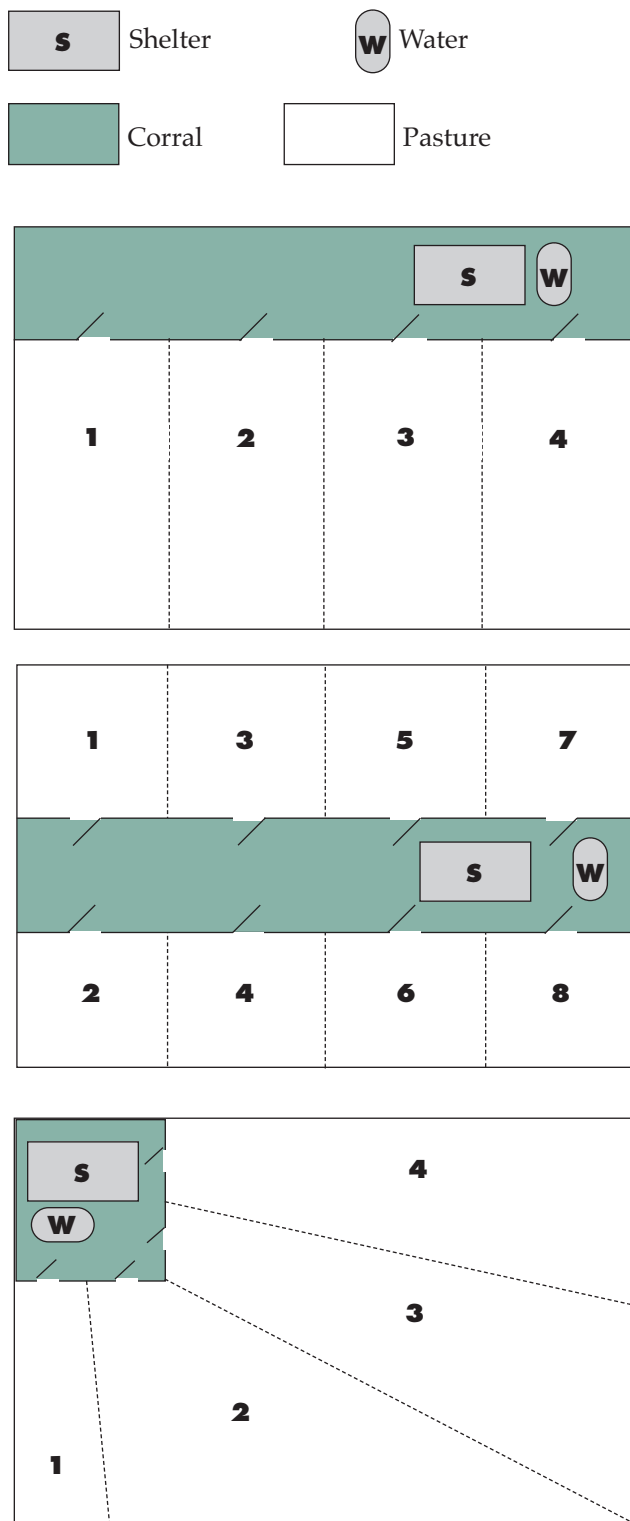
Proper management practices have a greater effect on productivity throughout the growing season than almost any other factor, including pasture species. Well-managed grass pastures can provide adequate amounts of protein and energy for 6 to 7 months of the year, while poorly managed pastures will rarely produce enough forage to meet animal needs (figure 1). Thus, pasture management will determine the amount of forage available from pasture and the amount that needs to be purchased. The following practices will lay the groundwork for a good pasture management program.

**Make sure the stocking rate (body weight of horses per acre) is in the appropriate range.** The stocking rate should be one 1000-lb horse per 2 to 4 acres. Horses eat in proportion to their weight, i.e. two 500-lb horses eat about as much as one 1000-lb horse if all other factors (age, sex, activity level) are equal. Further discussion will assume 1000-lb horses and you can make adjustments to horse number based on weight of your horses.

**Inventory resources.** Draw a map of your property or get an aerial photograph from the USDA Consolidated Farm Services Administration office in your county. The map should include fences, gates, and shelters. Include water, slope of land, types of vegetation and weed concentrations. Know the soil type of the land (particularly, whether it's all the same). Different soil types will have different production potential and will be best adapted for different species. This information can be obtained from the local USDA Natural Resources Conservation office in your county.

Have soil tested for fertility and pH level before seeding and every third year thereafter. Take soil samples using a soil corer or shovel to sample 6 inches deep. Have it analyzed to determine how much lime and the types and amounts of fertilizer needed.

**Figure 2. Sample designs for a rotational grazing system**



**Plan a rotational grazing system.** Grazing horses on smaller, multiple pastures will increase forage production without changing the stocking rate. Confining horses to a portion of the pasture encourages them to graze a higher percentage of the available forage and allows the remainder of the pasture to recover from grazing and hoof damage and to regrow at a faster rate. Several possible pasture designs are shown in figure 2. Your system will vary to fit your land and management style, but you should follow one of the basic designs.

When setting up a rotational grazing system, choose a number of pastures that fit your farm and grazing style. Pastures need not be uniform in size. Horses eat tonnage, so place fencing based on tonnage needed and seasonal growth of the grasses—not acres. All pastures must allow access to water. Fence lines should be drawn based on topography, soil productivity, and vegetation present. For example, low wet areas should be fenced separately from hilltops. It's important to fence similar vegetation because some species start growing earlier in the season, some grow better during summer, and legumes should be rested, not grazed, in the fall prior to killing frost.

**Understand pasture plant growth patterns and needs.** Cool-season pasture grasses begin growth early in the spring and produce half or more of their yield in May and June. They grow little during the hot, dry summer and begin to grow again in late summer. Grasses can grow in a wide range of soil pH and require moderate amounts of nutrients other than nitrogen. Nitrogen must be applied to grass pasture to produce adequate growth. Nitrogen fertilizer is immediately taken up and used only for the current growth period. For example, spring-applied nitrogen fertilizer will not be available for summer or fall growth. Greener grass rings around manure piles in the pasture are indications that the pasture may be nitrogen deficient to the extent that it is limiting

pasture yield. Consider applying nitrogen fertilizer as urea three times annually: April 15 for spring growth, June 15 for summer growth, and August 1 for fall growth. The first application may be skipped if spring growth exceeds needs.

Legumes are a high-quality forage that begin growth later in the spring than grasses but provide slightly more growth during the summer. Legumes require higher soil pH (6.0 to 6.8, depending on the species) and more potassium than grasses. If growing conditions are good, legumes fix their own nitrogen from the air and do not require nitrogen fertilization.

It is a good practice to combine grasses and legumes in pastures. The varying growth patterns will provide more uniform pasture during the growing season. If legumes make up 40% of the pasture, nitrogen fertilizer is usually not needed.

**Manage grazing to benefit both horse and pasture.** Pasture plants have high energy and protein contents until they begin to flower, or head out. Therefore, grazing management should be designed to prevent or reduce heading. Pasture plants that are grazed too short will have reduced leaf area and recover more slowly to produce less yield for the season.

Horses can start grazing pasture as soon as plants green up in the spring. (They can graze earlier if leafy residue from last year is present). As pasture begins to grow, move animals among pastures so that each pasture is grazed about every 2 weeks during May. During the remainder of the season, the goal, except on bluegrass pasture, should be to put horses on pasture when grass growth is 10 inches tall. Animals should be moved to a new pasture when they have grazed pasture down to 4 inches. Bluegrass pasture does not grow as tall as other species and tolerates close grazing. It should be grazed when 6 to 8 inches tall and can be grazed down to 2 inches.

Grazing height recommendations should be tailored to grazing conditions. For example, in early summer when growth is lush, allow horses to graze only the top off of all pastures, leaving more than 4 inches of growth. On the other hand, during late summer or under dry conditions, it may be necessary to put horses into a pasture before it is 10 inches tall and to graze until less than 4 inches residue is left.

## Additional information

For more information on related topics, see the following publications available from your county Extension office:

*Determining Pasture Condition* (A3667)

*Field Crops Pest Management in Wisconsin* (A3646)

*Forages for Horses* (A2460)

*Identifying Pasture Grasses* (A3637)

*Pastures for Profit—A Guide to Rotational Grazing* (A3529)

*Sampling Soils for Testing* (A2100)

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