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Hay and Pasture for Horses in the North Central United States  
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Cooperative Extension Service  
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# Hay and Pasture for Horses in the North Central United States

**H**orses are an important part of the livestock population

in the north central United States. There are many horses in this region, though not as many as in the late 1920s when horses were used primarily for farm power. Currently, horses are used for entertainment, sporting events, companionship — some even provide therapy for handicapped persons. A few horses continue to provide power on farms that use them for farm work. Many horses are high performance animals used for racing and in special shows. Whatever their purpose, horses need good pastures that are free of weeds and obstructions. Pastures are an important part of a horse care program.

**P**astures can provide high quality feed as well as a place to exercise the animals. Outlined here are the basic principles for developing and managing forage crops used for hay and pasture for horses. Working out the details at each location can be challenging. A good way to start is to visit a successful horse pasture and your local county Extension office. Selecting seeding mixtures, fertilizer and other necessary materials provides

an opportunity to match the grasses and legumes to field soils as well as add

valuable forage resources. In many cases, pastures can be designed so that extra forage can be harvested for hay for feed during the winter.

**F**ollowing are several alternatives for planning hay and pasture. These are just some of the options available. After your visit with your local county agent, you may explore others.

- Designing an intensive grazing program using high-tech fencing equipment for existing pasture. Rotational grazing will add one-third to your carrying capacity.
- Improving existing pastures through winter seeding, fertilizing, interseeding or changing the grazing patterns to provide better use of production potential. Using needed fertilizers can more than double the annual production of hay or pasture.
- Seeding new pastures or hay fields to last 5 years or more.
- Seeding temporary pastures for 1 to 3 months of summer feed.
- Designing a comprehensive plan using

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combinations of practices over several years to achieve your goals. Leave yourself some room for new things that you might want to try, but keep in mind the needs for feed and space for your animals.

**M**any grasses and legumes can be used for pasture in the north central United States. The following recommendations have resulted from pasture work conducted at Michigan State University.

As you plan your pastures and hay seedings, consider the following basic principles:

■ Whenever possible, include a legume with the grasses. Legumes draw nitrogen from the air. When they make up at least 30 percent of the pasture plants, legumes can supply 50 lb. nitrogen/acre or more each year to the grasses. That is an easy way to supply needed nitrogen for the grasses. The nitrogen is free, but the legumes need phosphorus and potassium fertilizer along with good management to persist. Alfalfa makes good hay and is long lived with proper management. Try keeping the hay or pasture mixture about half legume to avoid feeding too much straight legume pasture. Alfalfa is the first choice for the legume seeded for hay or pasture. Where wet soils require alternatives, try red clover or birdsfoot trefoil.

White clover, also a legume, rarely needs to be seeded, since it is a native plant and its seed is present in most soils. When pure stands of clover or birdsfoot trefoil are grazed by white horses, they can become photosensitive. An improved cool-season grass such as timothy, brome grass or orchardgrass is needed in most pasture mixtures. The grass will increase dry matter production and decrease the potential problems that can arise with a pure legume pasture.

■ Insects can become important plant pests. Be sure to check your pastures and hay fields regularly and use appropriate sprays only as needed. If the alfalfa weevil begins to appear in large numbers and you're well into rotational grazing, a timely cutting for hay can solve that problem. Check the stubble for reinfestation and spray if necessary. Before spraying, take into consideration that losing a few leaves to insects is not as bothersome as having to stable the horses so you can spray the pasture for insect control. For more detailed information on alfalfa weevils, contact your local Extension Service office.

■ Soil testing should be required. The time and money spent to collect soil for testing can quickly be recovered in savings on fertilizer or lime and improved productivity. Check with your county Extension agent or fertilizer dealer several months in advance of fieldwork. If lime is needed, start working the lime into the field 6 months before seeding. If that's not possible, try putting half down at seedbed preparation time and half at seeding time. Fertilizer for new seedings is best placed in a band 1 1/2 inches below the seed. Established pastures needing fertilizer are best treated in the fall. In no-till seedings, surface applications are used for both lime and fertilizer. These treatments have been successful on light sandy and sandy loam soils in Michigan. Research from other states has shown that using surface-applied lime on heavy clay soils for no-till seedings of alfalfa has not been successful.

Using the three principles of including legumes, watching for insects but not overreacting, and soil testing, you're ready to plan your hay or pasture program.

## Planning pastures to last 5 years or more

Examine the conventional methods for seeding before choosing no-till. In either case the results can be spectacular, but it takes planning. In some cases, you'll need to work the field a full season ahead of planting. Brush and weeds such as quackgrass should be dealt with using fall treatments of herbicide and/or tillage the year before you seed.

Follow soil test recommendations for best results. Using the right fertilizer at the right time will cut costs and add to the success rate and life of the seeding. Review the recommendations and use all the fertilizer needed, based on the test results and your yield goals.

Field preparation should be done as early in the spring as field conditions allow. The results should be a clean and fairly firm seedbed. When you walk in the field, your foot should sink no more than an inch or so, about the thickness of the heel on your work boot.

Spring seeding using oats as a companion crop is a popular method for establishing new plantings. Using a grain drill with grass and legume attachments and band-seeding capabilities is likely to give the best chance of success. If you need high oat yields because of the value of grain and straw, consider solo seedings following the grain harvest. Oats can be competitive, and a 3- or 4-week dry spell in midsummer means disaster for the new seeding grown with a small grain companion crop. Select one of the mixtures on page 5 to fit your soil conditions.

Seedings should be shallow — 1/4 to 1/2 inch deep — and made using packing wheels or a cultipacker. Smooth brome grass is difficult to seed unless you have a grass seed attachment. Other

options are to mix the grass seed with the oats at seeding time or with the fertilizer. There are many options for seeding, but band-seeding of the legume directly above the fertilizer band has given the best results.

Oats are popular in horse diets, so many farmers leave the oats to mature. Another alternative is to cut the oats for hay or silage when they reach the soft dough stage. In either case, don't allow the hay or straw to stay on the field more than a few days. Removing the hay or straw from the field prevents the development of dead spots that later turn into weed patches. Delay plans to pasture the new seeding until the year following establishment. Though it may be tempting to graze or cut a crop of pasture late in the fall the first year, we recommend you not graze it late in the seeding year. (Clear-seeded alfalfa planted in early spring without a companion crop can be cut for hay in the seeding year.) Late grazing subtracts from next year's growth. In the northern regions, it's easy to kill a new alfalfa seeding by untimely fall use or very early spring grazing. Careful grazing management can add life to legume pastures and hay fields. Allow a few flowers to show in the legumes before cutting or pasturing. After the first year of production, alfalfa and other legumes have mature root systems and a greater capacity to recover from early- and late-season harvest.

Following the first year of use, most pastures will need maintenance applications of fertilizer. Again, rely on soil tests to monitor what's required. In general, grass-legume mixtures need phosphorus and potash. Pastures with less than 30 percent legumes will need extra nitrogen. Apply at least 75 lb. nitrogen to grass pastures during spring and again in late summer as needed. Fall applications of phosphorus and potassium will add to the winter hardiness and the productivity of

pastures. Weeds generally invade weak pastures and are good indicators that something other than spraying for weed control is needed.

It is possible under intensively grazed pastures to reach full nutrient turnover, when little or no added fertilizer is required. When all of the manure is returned to the pastures and soil tests plus experience show that little fertilizer is needed, you will benefit little from the extra costs for P and K. Most pasture sites, however, are not likely to reach full nutrient turnover even with good pasture management because of past overuse and low levels of native soil fertility.

**A**nother option for stand establishment is summer solo seedings or clear seedings of alfalfa. Dry spring weather, the need for extra oat straw and grain, or work schedules that prevent timely early seedings with a companion crop may force alternative establishment methods to be used. There are several rules to observe for summer solo seedings:

- Seed before August 1 in the northern regions and August 15 in southern regions. If by chance it's getting late in the season and the weather is very dry, wait until next spring.

- Generally follow the same seedbed preparation used to develop good horse pastures in the spring. Plowing the field after grain harvest will prevent some volunteer wheat, oats or barley.

In general, do not use a companion crop when seeding alfalfa in late summer. Plant only the legume, using herbicides if weed problems are anticipated. Weeds are less likely to be competitive in mid- and late summer seedings, but when chickweed is present, herbicide use is recommended. Plow and work the field to destroy any weeds before seeding. Especially, kill quackgrass. If necessary,

use a herbicide such as Round-up, following the label directions on rates and waiting time before seeding.

If the field has been in hay or pasture, graze it heavily, then plow and work the field from July 1 until you seed. Growing a small grain crop or row crop a year before seeding a legume and grass pasture reduces weed and insect pressure on the new seeding.

If making no-till seedings into grain stubble, control weeds before seeding. A complete burn-down is needed for difficult-to-control weeds, and herbicides are recommended. In establishing no-till seedings, more problems generally occur because of the lack of vegetation control than from other causes. Some unknowns remain with no-till directly into grass sods, and for that reason we prefer seeding alfalfa into a clean prepared seedbed that has been in other crops whenever replacing old grass pastures.

Alternative legumes such as red clover and birdsfoot trefoil can be successfully seeded using no-till or frost seedings (during early February). Most improved cool-season grasses such as bromegrass can be snow seeded successfully.

Though these procedures allow flexibility in dealing with difficult sites such as hilly, rocky and wet soils, the preference is for clear seedings in prepared seedbeds.

### **Temporary pastures**

Oats, wheat, rye or barley, and triticale can provide short-term pastures for about one or two months. Spring small grains should be planted in April at the rate of 2 bushels per acre. Follow soil test recommendations to apply P and K and use only a small amount of nitrogen (40 lb./acre). You can add additional nitrogen after the small grains have emerged. Weeds can be a problem in some fields, so destroying the old sod is recommended.

You can use no-till for seeding small grains for temporary pastures. This offers an option for sites needing erosion control. No-till requires special equipment. Fertilizers can be banded or top-dressed, depending on the equipment used. A good management strategy would be to gain some experience on a limited scale before attempting large plantings. Do not start to graze the small grain pastures until the plants are 6 to 8 inches tall.

Though sudangrass and sudan/sorghum hybrids make good hay and temporary pastures for most livestock, sudan and sorghums are not recommended for horse pastures. Seed is labeled with warnings not to use as horse pasture because of cystitis syndrome in horses. Grazing even for short periods with horses is simply not worth the risk. Plan a full complement of other permanent pastures for grazing rather than relying on temporary pastures year after year.

### Improving existing pastures

Grassy sods with less than 30 percent alfalfa, clover or birdsfoot trefoil respond to added nitrogen (N) as well as phosphorus ( $P_2O_5$ ) and potassium ( $K_2O$ ). Fall applications of fertilizer plus the benefit of timely rains strengthen grass stands, and in many cases 100 lb. N - 20 lb.  $P_2O_5$  - 80 lb.  $K_2O$  will double pasture production the next season.

To improve pastures too wet for alfalfa, try frost seeding red clover or birdsfoot trefoil. Graze the fall pasture growth to expose the soil to freezing and thawing, and overseed in February or March. Do not expect to establish alfalfa using frost seedings. Experience in Michigan over the years shows a high probability of failure when alfalfa is frost seeded.

### Seeding mixtures:

The following mixtures are recommended:

#### On well drained clay, loam or sandy soil, use one of the following:

No. 1	
Alfalfa	8 to 10 lb./acre
Smooth bromegrass	4 lb./acre
Timothy	2 lb./acre
No. 2	
Alfalfa	8 to 10 lb./acre
Timothy	5 lb./acre
No. 3	
Alfalfa	2 lb./acre
Red clover	3 lb./acre
Smooth bromegrass	6 lb./acre
Timothy	2 lb./acre

#### On well drained sandy loams or loam soils, use one of the following mixtures:

No. 1	
Alfalfa	8 to 10 lb./acre
Smooth bromegrass	4 lb./acre
Timothy	2 lb./acre
No. 2	
Alfalfa	8 to 10 lb./acre
Smooth bromegrass	4 lb./acre
Orchardgrass	2 lb./acre
No. 3	
Smooth bromegrass	7 lb./acre
Timothy	2 lb./acre

#### On soils with variable drainage with some poorly drained soil, use one of the following mixtures :

No. 1	
Alfalfa	8 to 10 lb./acre
Red clover	3 lb./acre
Timothy	5 lb./acre
No. 2	
Alfalfa	8 to 10 lb./acre
Red clover	3 lb./acre
Smooth bromegrass	4 lb./acre
No. 3	
Birdsfoot trefoil	5 lb./acre
Smooth bromegrass	6 lb./acre
Orchardgrass	2 lb./acre
Timothy	2 lb./acre
No. 4	
Smooth bromegrass	7 lb./acre
Timothy	4 lb./acre
Orchardgrass	4 lb./acre

#### On wet mineral soils, use one of the following:

No. 1	
Birdsfoot trefoil	5 lb./acre
Smooth bromegrass	4 lb./acre
or timothy	2 lb./acre
No. 2	
Smooth bromegrass	12 lb./acre

For assistance in understanding your soils, call your local Soil Conservation Service or county Extension office.

### **Selecting varieties of grasses and legumes**

Most of the alfalfa varieties being sold have been extensively tested for hay production. Select a long-lived, highly productive variety that has the disease resistance needed. Your local county Extension office probably has lists of recommended varieties. Several new grass varieties have improved productivity and disease resistance. Choose only high quality seed for your new plantings.

### **Managing pastures**

Horses are spot grazers, and their grazing characteristics differ from those of sheep or cattle. Horses respond to rotational grazing. It takes 2 to 4 acres to produce feed for one mature horse for the 6-month grazing period. Pastures that produce 4 tons of hay per acre are capable of carrying a mature horse during the grazing season. Horses seem to trample quite a bit of pasture, as well as not grazing areas soiled with manure. Keeping the pastures productive requires detailed care and good management. Following are some key management items:

- Start grazing when the pasture is 6 to 8 inches tall. A good time to start grazing alfalfa is when it reaches the bud stage. Pure stands of bluegrass and ryegrass pastures can be grazed several weeks earlier than alfalfa or alfalfa-grass mixtures.
- Allow horses to graze pastures to 2 to 3 inches before moving them on to the next paddock. It may be necessary to clip pastures to control old grass and weeds. Clipping can encourage legumes by controlling rank grass and weed growth that horses don't eat. Remove the excess clippings for hay or bedding to avoid smothering the legumes.

ering the legumes.

- Keep the horses out of the main pastures when they are wet and muddy. In wet weather, horses can punch up the fields badly and ruin good pastures.
- If you are short of pasture, as can often happen during midseason, stable the animals and feed hay to allow the grass and legumes a chance to regrow to 6 to 8 inches.
- Opinions differ on manure management in pastures. Spreading the manure using a chain harrow or similar implement will help promote more even regrowth and grazing.
- Rotational grazing of a clean pasture can help control parasites and discourage some animal diseases. Rotational grazing by dividing a pasture into two units makes better use of the forage than continuous grazing and adds to carrying capacity.
- Keep a sharp eye out for mechanical hazards such as wire, grass, nails and old iron. Remove them promptly.
- The new wide colored poly tape is a relatively inexpensive way to electrify pastures for rotational grazing. Training horses to see the modern fences can be a problem. Placing white or colored flags on the fence can be helpful. Do not use barbed wire.
- Use good legume management. When grazing alfalfa, allow 3 to 4 weeks for recovery between grazings and allow a full rest period (4 to 6 weeks) in the fall. Good fall management can add years to the life and productivity of the pasture.
- Use soil tests to monitor soil fertility levels. Don't guess at what's needed. Monitoring the levels of P and K tells you to add only what's needed for a long, productive life for the pasture. Every farm is different, and even various fields within a farm will likely need to be fertilized.

ized differently. Your local county Extension office can help you calculate the fertilizer applications necessary to maintain top production.

### **Keeping the turf in paddocks**

A good, well managed and fertilized pasture provides ground cover and high quality forage. Keep your mixtures simple and well fertilized. During the early years, avoid turning horses onto the pasture when the surface is wet or soft. Do not overgraze.

### **Tall fescue**

Avoid pasture mixes containing tall fescue. Tall fescue is generally low in palatability and horses refuse to eat it. A

pasture with tall fescue over time becomes dominated by it. The endophyte that most tall fescue contains can cause health problems in grazing animals. If fescue is used, be certain to plant endophyte-free fescue seed.

### **Equipment**

To establish a pasture, use a drill that places the grass and legume seeds not more than 3/4 inch below the surface. On most soils, you'll need to pack the surface with press wheels, a roller or a cultipacker. On small acreages, much of the equipment used to establish lawns can be used to seed pastures.

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