

Pasture and hay forage crops generally fall into four categories:

- 1) Legumes
- 2) Cool Season Grasses
- 3) Warm Season Grasses
- 4) Alternate/annual forages

The last category includes many perennials crops, such as rape, kale, comfrey, and all annual forage crops, such as sudangrass, sorghum, and various millets. None of these should be considered for horse pasture in other than emergency situations.

Warm season grasses are generally adapted to warmer climates than Minnesota, Michigan and Wisconsin because they require warmer temperatures to grow. Therefore they start later in the spring and quit growing earlier in the fall than cool season grasses. These species include most prairie species, such as switchgrass, big bluestem, little bluestem, and indiangrass. Warm season grasses are used for ground cover and wildlife in northern states but if grazed extensively will be crowded out by cool season grasses that will come in naturally. Neither should warm season grasses be mixed with cool season grasses in pastures because the cool season grasses will predominate. Warm season grasses are generally not recommended for horse pasture in the northern states.

Cool season grasses are most adapted to grazing in northern states. They start growing early in the spring and produce the bulk of their growth in May and June. Some cool season grasses will continue to provide good forage through the summer and fall if fertilized with nitrogen fertilizer in June and August. The common cool season grasses can be identified using UW extension publication A3637, "Identifying Pasture Grasses" on the web at: <http://learningstore.uwex.edu/Identifying-Pasture-Grasses-P176.aspx>.

The cool season grasses generally fall into two categories: sod formers and bunch grasses. Sod formers spread vegetatively by underground shoots and form a solid mat (Kentucky bluegrass is an example). Sod forming grasses suffer less damage when grazed in wet conditions. Sod forming grass will fill in spots that have been killed out. Bunch grasses are generally faster to establish and recover from grazing more quickly but each plant comes from a separate seed and stands may become 'bunchy' as they thin.

Several choices exist for the long-lived grass depending on soil type, location, and needs of the landowner. These are listed in the UW extension publication A1525 entitled "Forage Variety Update for Wisconsin." It is available from your county extension office or on the web at: <http://learningstore.uwex.edu/Forage-Variety-Update-for-Wisconsin2010-Trial-Results-P175.aspx>.

Major **sod forming cool season grasses** are Kentucky bluegrass, smooth brome grass and reed canarygrass.

- **Kentucky bluegrass** is most commonly used for horse pastures. This grass is more traffic tolerant than most grasses. It is very high in forage quality and very palatable. It is more drought and flood tolerant than many species. It is also very tolerant of overgrazing. Kentucky bluegrass grows only 20 to 24 inches tall so the pastures do not look as rank as when other taller-growing species are planted. It establishes easier than smooth brome grass or reed canarygrass. It is very high quality and very palatable. However it is the lowest yielding grass species commonly used in pastures for all but the northern regions of Minnesota, Wisconsin and Michigan. Kentucky bluegrass should be used for pasture where adequate (or more) acreage exists for horses.
- **Smooth brome grass**, along with Kentucky bluegrass and quackgrass, are the most common species in unimproved pastures in the northern Midwest. It is the most winterhardy grass species we grow. Smooth brome grass is adapted to drought and higher temperatures and is therefore not recommended in northern Wisconsin, Minnesota, or Michigan. This grass is generally the second highest yielding grass south of a band approximately 100 miles south of the Canadian border. It is slow to establish, though not as difficult as reed canarygrass. The major problem with smooth brome grass is that two-thirds or more of the yield will occur

during May and June with little regrowth the rest of the year. It is also slow to recover after mowing or grazing. This is fine for hay but work less well for grazing due to poor yield distribution. Smooth bromegrass works well for fields that are harvested for hay in June and grazed the remainder of the growing season.

- **Reed canarygrass** is an excellent grass that tolerates flooding and drought. It is frequently sown in low areas. Reed canarygrass is extremely winterhardy. It is the highest yielding grass grown in the Midwest. It grows up to 5 feet tall if not mowed or grazed. It is a sod former, so will fill in areas. This trait has also caused it not to be recommended by some who consider it an invasive species. Seed is expensive and reed canarygrass is slow to establish, often taking a year or more to get a stand. If growing reed canarygrass, be sure to plant low alkaloid varieties, such as Venture, Rival or Palaton.

Major **cool season bunch grasses** are orchardgrass, timothy, tall fescue, meadow fescue, Italian (annual) ryegrass, and perennial ryegrass.

- **Orchardgrass** is an excellent grass for either pasture or hay. It establishes quickly, is ready to graze early in the spring and recovers quickly from grazing. It produces more forage in the late summer and early fall than any other cool season grass. It is important to select a good variety because some are not winterhardy enough for Wisconsin and Minnesota. Orchardgrass varieties also vary in maturity. Early types may be planted with red clover. Medium-late to late types should be planted in mixtures with alfalfa or other grasses, so that all species of the mixture mature at the same time. See www.uwex.edu/ces/forage for a listing of orchardgrass maturities. Disadvantages are that orchardgrass has moderate winterhardiness and will die out once in a great while. Note in the table how important it is to pick the right variety. Also, because of its quick recovery after haying or grazing, it may be difficult to graze a large portion of pasture while the orchardgrass is in an acceptable maturity range. For these two reasons, we recommend no more than 30% of the total pasture be planted to orchardgrass. It is also very important to plant the right variety. We recommend selecting varieties which are winterhardy, rust resistant, and have good seasonal yield distribution. When orchardgrass gets too mature in a mixture horses will avoid it and graze only other species.

Variety	2 nd year ground cover (%)
Potomac	95
Orion	100
Boone	100
Sterling	75

- **Timothy** is an old standby for horses. It is moderately easy to establish. It is very palatable, both horses and cattle prefer it to most other grasses. However, it is low yielding and tends to be short-lived, lasting only 3 to 5 years in most stands. It also heads out most of the summer while all other grasses, except the ryegrasses, head only once in May and June and all regrowth is strictly vegetative. Timothy is best adapted to cool, wet soils and should only be grown in central and north regions of northern states. Its seed size is different than most grasses and must be seeded separately. If mixed with other grass seed in the seeder, timothy will settle to the bottom of the seeder and be seeded first. Because of this it is seldom seen in pasture mixtures. It is generally not recommended for pastures except in cool areas with wet soils near the Great Lakes.
- **Tall fescue** is an easy to establish bunchgrass that is only slightly less adapted to flooding and drought extremes than reed canarygrass. It is the most traffic and shade tolerant of any of the mentioned grasses. On the negative, tall fescue is less unpalatable than other grasses. Also, if using, one must be sure to get endophytic fungus-free seed. This internal fungus produces an alkaloid that can be detrimental to horses and other animals. Volunteer tall fescue or that growing in ditch banks or grassed waterways is likely fungus infected. Due to its low palatability it is seldom used in pastures of the upper Midwest. It is very common across southern Iowa, Illinois, Missouri, and Arkansas. However, a fungus free type may be the best choice for shady or high traffic areas even in the upper Midwest. Rust resistant varieties should also be selected.
- **Meadow fescue** is a cool season perennial bunch grass that has been widely used in Canada. It may be more useful than tall fescue in northern managed grazing systems, particularly with new varieties being released for grazing. This species can tolerate frequent grazing or mowing better than most grass species. It has “softer” leaves and greater palatability than tall fescue. Meadow fescue is adapted to lowlands. It grows under cool, moist conditions, and tolerates wet and occasionally flooded soils. Once established, it also performs under drier conditions than most grasses. It yields relatively better than most other grass species in late summer if fertilized. Meadow fescue is slow to establish (like smooth bromegrass) and is best seeded in the spring. It is very susceptible to leaf rust so rust resistant varieties should be planted.

- **Italian ryegrass** is a rapidly establishing, high quality forage. It will grow and yield into late July or early August. However, it is lower yielding than many other grasses and will tend to die out over winter. Its primary use is to overseed damaged areas and as a cover crop in mixtures when establishing other longer-lived grasses. Be sure to buy forage types, not turf types. (Note also that ryegrass is different from rye which is a cereal grain crop.)
- **Perennial ryegrass** is a rapidly establishing, high quality forage. It will grow in early spring and late early fall. However, it is lower yielding than many other grasses and may die out over winter. Its primary use is in pasture and hay fields in northern Wisconsin and Minnesota where snow cover will keep stands in for 3 to 4 years. Be sure to buy forage types, not turf types.

The last category of forages important to horse owners is **legumes**. There are several choices available for pastures including alfalfa, white clover, red clover, birdsfoot trefoil, ladino clover, alsike clover, and kura clover. More detail on specific varieties presented in the UW extension publication A1525 entitled "Forage Variety Update for Wisconsin," available from your county extension office or on the web at: <http://learningstore.uwex.edu/Forage-Variety-Update-for-Wisconsin2010-Trial-Results-P175.aspx> or on the University of Wisconsin Forage website at <http://www.uwex.edu/ces/forage>.

- **Alfalfa** is the most common legume in the dairy regions. It is the highest yielding and generally will persist for 4 to 6 years. It is primarily a hay and silage crop because alfalfa grows very erect. Alfalfa is also a good grazing crop but will be too rich for most horses unless mixed with about 50% grass. It can be dual used for hay in the spring and grazing thereafter. It requires a soil pH of 6.8 or higher and does not do well in poorly drained soils.
- **White clover** is the most common clover in pastures. It is easy to establish (even by frost seeding) and is the most drought tolerant. It is also the most tolerant of over grazing. White clover spreads by above ground runners called 'stolons.' This clover tends to be low yielding. There are several types of white clover and one should be sure to plant the medium or Dutch types. These will grow 6 to 8 inches tall and are moderate yielding. Common white clover should be avoided because it will only grow 3 to 4 inches tall and is very low yielding. Taller growing types (such as Ladino clover) will tend to be shorter lived and will need to be reseeded periodically. Dutch and medium white clovers are recommended for horse pastures, especially for mixing with Kentucky bluegrass. Soil pH should be at least 6.0
- **Red Clover** is the most common pasture legume species in Wisconsin. It is a fast-establishing clover. It is the highest yielding of the clovers. Soil pH should be 6.2. It is high yielding and establishes quickly and easily. Good varieties will last for four years - cheap varieties for two years. It is possible to frost seed this into grass pastures in most parts of the upper Midwest. Rarely, red clover gets a fungus on the stem that can cause slobbers in horses and cattle. However, this occurs so infrequently that most dairy graziers use red clover and, if the problem occurs, simply withhold animals from the pasture until the problem goes away.
- **Birdsfoot trefoil** is a long-lived legume that is high in quality and maintains its quality longer than most other legumes. This makes it good for stockpiling (i.e. allowing it to mature and save it for periods of drought or late fall/early winter grazing. It tolerates wet conditions second only to alsike clover. Birdsfoot trefoil yield is especially good in the northern parts of Minnesota, Wisconsin and Michigan.
- **Alsike clover** is frequently mixed with **ladino clover** for use in wet soils. Alsike is easy to establish (can frost seed) and but stands usually only last 2 to 3 years so other legumes should be used where soil drainage is adequate. But ladino and alsike may still be the best bet on low wet soils. Alsike clover sometimes get a fungus on the stem that causes horses to salivate.
- **Kura clover** is a rhizomatous legume (spread by underground runners). It is high yielding and persistent. However it is very slow to establish, often taking up to two years to get a good stand. For this reason, it is not currently recommended for horse pasture.

When seeding new pasture is best to seed a mixture of grasses and legumes. However, one should avoid putting too many species in the mix to avoid competition among the components and increase difficulty of grazing management when species do not mature at the same time. A good pasture mix to seed consists of three components:

- ✓ a long lived grass, e.g. orchardgrass, meadow fescue, smooth brome grass, bluegrass or reed canarygrass
- ✓ a legume
- ✓ a cover crop or short lived grass, such as Italian ryegrass. Oats has often been used as a cover crop but is not recommended because Italian ryegrass provides better grazing.

Some common mixtures are:

Mixture 1

Kentucky Bluegrass	15 lbs/a
Medium white clover	4 lbs/a
Italian ryegrass	2 lbs/a

This is the most common horse pasture mix. Bluegrass is moderately drought tolerant and very winterhardy. It is a sod former so will fill in. It also does not get as tall as other grasses and keeps pastures looking better. However, it is among the lowest yielding grasses. Dutch clover may be substituted for medium white clover.

Mixture 2

Brome grass	10-12 lbs/a
Red clover	4 to 6 lbs/a
Italian Ryegrass	2 lbs/a

This is the most common mixture which is high yielding brome grass is extremely winterhardy, and moderately drought tolerant. However, brome grass does not yield as well through July, August and September as Orchardgrass

Mixture 3

Orchardgrass	10 lbs/a
Red clover	6 lbs/a
Italian ryegrass	2 lbs/a

This is a high yielding pasture mix that will recover quickly after grazing. This grass yields more late in the season than any other mix. However the mix will not fill in because orchardgrass is a bunchgrass.

In most cases it would be good to plant some pastures to one mix and some to another because each will do better under certain conditions and at certain times of the year. By having different pastures of different mixtures, you will have good growth during a larger portion of the season and across a wider range of environmental conditions.

Lastly, it is important to remember that seed of vastly different sizes cannot be mixed together for seeding. For example, if brome grass and clover are mixed together, the clover will settle to the bottom of the seeder box and be seeded first and the brome grass later. Orchardgrass, meadow fescue, bluegrass, and ryegrass can be mixed in a seeder as can alfalfa and clovers. All mixtures should be put into seeder near the field to be seeded to avoid separation of mixture components prior to seeding.

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