

Pasture Species Selection for Sheep

by **Dan Undersander**, University of Wisconsin

Pasture and hay forage crops generally fall into four categories:

1. Legumes
2. Cool Season Grasses
3. Warm Season Grasses
4. Alternative/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 sheep pasture other than in emergency situations.

Warm season grasses are generally not recommended for sheep pasture in the northern states. They are generally adapted to warmer climates than Minnesota, Michigan and Wisconsin because they require high temperatures to grow. Therefore, they start growing later in the spring and quit earlier in the fall than cool season grasses. These 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. Warm season grasses should not be mixed with cool season grasses in pastures because the cool season grasses will predominate in 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.

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 and will fill in spots that have been killed out. Bunch grasses generally establish faster 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 entitled [A1525 Forage variety update for Wisconsin](#). It is available from your county extension office or on the web at: <http://learningstore.uwex.edu/assets/pdfs/A1525.PDF>.

Major **sod forming grasses** are Kentucky bluegrass, smooth brome grass and reed canary grass.

- **Kentucky bluegrass** is commonly used in many sheep 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 grass 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 canary grass. However it is the lowest yielding grass species commonly used in pastures for all but the northern regions of Minnesota, Wisconsin and Michigan.
- **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 more adapted to drought and higher temperatures than other cool season grasses 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 canary grass. The major problem with smooth brome grass is that two-thirds or more of the yield occurs 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 not for grazing. Smooth brome grass 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 and so will fill in vacant 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 **bunch grasses** are orchard grass, timothy, tall 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.

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

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 species. We recommend late maturing varieties, which are slightly more expensive than early maturing types, but mature at a time more compatible

with other species. When orchard grass gets too mature in a mixture sheep will avoid it and graze only other species.

- **Timothy** is an old standby. It is moderately easy to establish. It is very palatable, both sheep 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 or 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 or mixed with legume seed. If seed is mixed with other grass seed in the seeder, timothy will settle to the bottom of the seeder and be seeded first. Because of this timothy is seldom seen in pasture mixtures.
- **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 very unpalatable. Also, if using, one must be sure to get fungus-free seed. The internal (endophytic) fungus produces an alkaloid that can be detrimental to sheep and other animals. Volunteer tall fescue or that growing in ditch banks or grassed waterways is likely fungus infected. Tall fescue is very common in pastures 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.
- **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 with 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 sheep owners is **legumes**. 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 Forage Variety Update for Wisconsin](http://www1.uwex.edu/ces/pubs/pdf/A1525.PDF) available from your county extension office or on the web at: <http://www1.uwex.edu/ces/pubs/pdf/A1525.PDF>.

- **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 sheep 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 will tend to be shorter lived and will need to be reseeded periodically. Dutch and medium white clovers are recommended for sheep pastures, especially for mixing with Kentucky bluegrass. Ladino clover is the tallest growing type but is short lived. 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.
- **Birdsfoot trefoil** is a long-lived legume that reseeds naturally. It 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.
- **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 sheep pasture.

When seeding new pasture it 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 mix to seed consists of three components:

1. a long lived grass, e.g. orchard grass, timothy, smooth brome grass, bluegrass or reed canary grass.
2. a legume.
3. a cover crop or short lived grass, such as Italian ryegrass. Oats have often been used as a cover crop but are 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

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	4-6 lbs/a
Italian Ryegrass	2 lbs/a

This is the most common mixture as high yielding bromegrass is extremely winter-hardy and moderately drought tolerant. However, bromegrass does not yield as well through July, August and September as Orchard grass.

Mixture 3

Orchard grass	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 is wise to plant some pastures to one mix and some to another because each mix will do better under some 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 bromegrass and clover are mixed together, the clover will settle to the bottom of the seeder box and be seeded first and the bromegrass later. Orchardgrass, bluegrass, timothy, ryegrass, alfalfa, birdsfoot trefoil, and clovers generally will not separate during seeding. All mixtures should be put into seeder near the field to be seeded to avoid separation of mixture components prior to seeding.