

# Double cropping forage after wheat or pulse crops

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## Hay production

When planted in early July, sorghum-sudangrasses can produce 3 to 4 tons by early-mid September where pearl millet will likely produce 2 to 3 tons per acre, although there are improved varieties of pearl millet that can produce similar forage yields. Drying may take 3 to 5 days for sorghum-sudangrass since it has large stems. Using a hay conditioner to crush the stems will increase the rate of drying. Pearl millet has slightly smaller stems. This may speed the drying rate, but a hay conditioner is still needed. If making hay, a higher seeding rate may help to reduce stem size.

Foxtail millet hay yield is less than sorghum-sudangrass or pearl millet. Typical hay yields range from 1.5 to 2.5 tons/acre, but it is also earlier maturing and fine stemmed. This can be a benefit when harvesting hay. Seed cost is also usually less for foxtail millet.

Forage quality of the hay depends on the stage of maturity at harvest. A good balance between yield and quality is to cut sorghum-sudangrass or pearl millet hay during the boot stage. Forage quality can range from 55 to 65% total digestible nutrients (TDN) and 6 to 10% crude protein when the plant is between boot and dough stage.

## Silage production

While both sorghum-sudangrass and pearl millet can be used for silage. Forage sorghum may be a better option for silage production due to its greater yield potential with expected yields of 4 to 6 tons of DM (11 to 17 tons at 35% DM). The energy content of sorghum silage can be 60 to 65% TDN with a crude pro-

tein content of 7 to 8%. A good target is to harvest at soft dough, especially if you do not have the ability to process the kernel. It may be necessary to swath and then chop to get the correct moisture (30 to 35%).

## Grazing during the summer and fall

Sudangrass (not the hybrid) may be best suited for grazing. Sudangrass usually has less yield potential than sorghum-sudangrass. It has smaller stems and will regrow after the initial grazing, resulting in equal or better yields in a grazing situation. Pearl millet can also be used for grazing, and unlike sudangrass and sorghum-sudangrass, it does not produce prussic acid which means that it can be grazed during the initial frost period. Grazing can begin when sudangrass and pearl millet reach 15 to 20 inches in height, but cattle should be moved when stubble height reaches 6 to 8 inches to allow for regrowth. If the growth is greater than 36 inches tall, harvesting as hay, or silage may be best since grazing cattle will trample the forage and result in both waste and slow regrowth.

## Grazing during the winter

*High yield, but lower quality winter grazing.* If the target animals are non-lactating, spring calving cows, then forage quality does not need to be high. In this situation, planting a forage with increased forage yield potential is a good option. Sorghum-sudangrass and pearl millet planted in mid-July, would have TDN from 50 to 55% and crude protein of 6 to 8% in the early winter. These forages are sensitive to cold temperatures and will usually die due to frost in early October.

Both sorghum-sudangrass and pearl millet can grow up to 5 to 6 feet tall. When grazing as stockpiled forages, managing forage allocation will greatly improve grazing utilization. In fact, windrow grazing or swath grazing is worth considering. Windrow or swath grazing makes forage allocation for grazing these tall forages much easier and reduces waste. Essentially this system involves cutting the forage and gathering it into a windrow or swath, which is then strip grazed.

These high yielding forages could also be used with supplementation to meet the needs of animals with higher protein and energy requirements. Pairing these forages with distillers grains in the winter can provide a cost effective winter method for developing heifers or fall pairs.

You can add additional species to increase diversity of the mixture that address other goals like building soil health. However, the grasses dominate when planted at recommended seeding rates and outcompete most other species that are planted with them. The seeding rates of the grasses should be reduced to allow for better growth of the other species, but this will also likely result in reduced forage yield.

**Lower yield, but higher quality winter grazing.** For moderate to high quality winter grazing, the cool-season, winter sensitive forages like oats, spring triticale and forage brassicas are good forage options. These species will have greater fall forage production than winter hardy species, such as cereal rye or winter triticale. The target planting date for cool-season winter sensitive forages is from late July through August. If planting oats or spring triticale in early August, there is likely a forage quality advantage with the “forage” varieties since they are later maturing. This may allow for greater quality than mid or early maturing varieties. If planting in mid- to late-August, there is likely little quality advantage to using forage varieties over dual-purpose or “grain” type small cereals.

Brassicas can be planted with winter sensitive small grains for grazing. While there are forage varieties, use of non-improved varieties such as purple top turnip or rapeseed may be the most cost effective. Nutritive value of brassicas, when planted in August, does not appear to vary much among brassica species. The brassicas are low in fiber and high in both energy and crude protein, with nutritive value more similar to concentrates than forages.

In general, brassica and small grains both maintain their quality well into the winter. Given their cost, either purple top turnip or rapeseed, can reduce seed cost compared to a small grain monoculture while simultaneously improving feeding value of the forage. Recent studies from UNL have shown oat brassica mixtures to have TDN levels in the 70 to 80% range with losses less than 5% into January. Crude protein of the brassicas is typically around 20 to 25% and oats 15 to 20% crude protein. Some have concerns about cattle choking on the root (bulb) of purple top turnips. Using a non-bulb brassica like rapeseed maybe more attractive in this instance.

Forage quality of late-summer planted small grain forages with or without brassicas is high and best suited to the requirements of lactating cows or growing calves. While there are a many combinations of seeding mixtures, a mixture of 50 lbs/acre of oats with 3 lbs/acre of rapeseed has produced forage yields similar to oats alone but slightly greater gains when grazing weaned calves. Weaned calves grazing stockpiled oats and brassicas have gained between 1.5 and 2.2 lbs/d.



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