

Sunn hemp's benefits could prove alternative forage crop in Wyoming

Sunn hemp may be an alternative forage option for supplementing livestock feed while also contributing nitrogen to soils with low fertility.

Sunn hemp (*Crotalaria juncea*) is an annual forage legume native to regions of India and Pakistan and is not related to industrial hemp or marijuana. The crop is called hemp because the stalks become very fibrous as the crop matures.

As a legume, sunn hemp has the ability to fix nitrogen (team up with soil bacteria) and use nitrogen from the atmosphere instead of nitrogen from a synthetic fertilizer. Additionally, legume feeds (primarily alfalfa, and more recently field pea and chickpea forage) are used by beef cattle producers as an excellent source of digestible protein and energy.

The crop can grow to over 6 feet tall, produce over 2 tons of biomass per acre, and fix 100 pounds of nitrogen per acre in as little as 60 days.

Sunn hemp description

Sunn hemp will not survive Wyoming winters; it hates the cold, but loves the heat of hot Wyoming summers, similar to other Wyoming crops such as sorghum, dry beans, and millet. Growth is from a primary stem with dark-green, nutritious leaves produced off the main stem (Figure 1). It is a short-day crop, which means it does not reliably flower with more than 12 hours of sunshine.

Wyoming has 12 hours of daylight starting mid-March through mid-September. The lack of flowering is a positive for Wyoming growers

because the crop maintains higher forage quality when in a vegetative state compared to a reproductive state. Keeping plants in a vegetative growth state is important to reduce seed production and eliminate potentially future weedy plants.

Stems become more fibrous as the crop matures. A more fibrous stalk means there is a tradeoff between increased tonnage and a decrease in either the nutritional value or the ability of the crop to decompose in the soil and add nutrients as a green manure crop.

What can it be used for?

Potential uses include fiber, fodder, or as a green manure cover crop. Sunn hemp in the U.S. has been used primarily as a green manure cover crop by incorporating plants into the



All photos: Carrie Eberle

Figure 1. Sunn hemp growing in July 2020 at the James C. Hageman Sustainable Agriculture Research and Extension Center (SAREC) near Lingle. Fine stems and lush green leaves show the plant structure.



Figure 2. Monoculture of sunn hemp in August 2020 at SAREC being swathed for hay.

soil to improve the quality for the next crop.

Sunn hemp can be used in grazing mixtures since it contributes to both the feed value and environmental value (by fixing nitrogen) of mixes; however, there is not a lot of information on the optimal ratio of sunn hemp in these grazing mixes.

There is also potential to grow sunn hemp as a monocrop as an alternative to hay (Figure 2). University of Wyoming researchers are evaluating sunn hemp as a supplemental hay to alfalfa. The adaptability to poor growing conditions, the potential to be grown with limited irrigation, and the ability improve soil health and system productivity is extremely desirable for production in Wyoming.

Growing in Wyoming

Wyoming growing season: The growing season for sunn hemp is June through August. Planting should be after the risk of frost (early June). Plants will die with the first fall freeze. Depending on the year, sunn hemp can grow through October. While three months may not seem like much time, this crop can do a lot in a short period of time.

Planting: Sunn hemp can either be planted as a monocrop or in a cover crop mix. It should be drilled at 25 to 40 pounds per acre at a depth of 1 inch. Seeding rate will vary depending on seed size, germination percent, and growing conditions. There are still questions as to the best planting practices. Most cover crop mixes come with the seeds pre-blended at the recommended seed ratio for the different species and the recommended seeding rate for the mix. This helps simplify planting.

Irrigation: Sunn hemp can be grown under irrigated or dryland conditions but in a dry year like 2020, will not produce high yields without supplemental water. If irrigating sunn hemp, be careful to not water too heavily when the crop is young. Let the soil dry between waterings. A young crop with yellow leaves and slow growth is likely receiving too much water. Sunn hemp appears susceptible to overwatering the first month of growth.

Harvest or grazing: If growing for a green manure crop, plan to incorporate sunn hemp when the crop is around 4 feet tall. It may have some flowers. If you let it grow much larger, you will likely need to mow it before

you can turn it into the soil because the fibrous stems will not break down as easily. Turn animals out when the crop is 3 to 4 feet tall if planning to graze the crop. There will be an abundance of thick green leaves, and the stems should not be too fibrous for livestock to eat.

There is no data on grazing a monocrop, so if you use this approach, you may want to plant a cover crop mix with some grasses to help balance the diet. It is suggested sunn hemp will not cause bloat. There is even less known about harvesting sunn hemp for hay. Work at UW is seeking to help answer this question, but it appears harvest at 4 to 5 feet may be most compatible with swathing and baling equipment. The leaves on the plant dry quickly, while the stems hold moisture much longer. Raking and baling with a dew on the crop will help maintain the leaf material, which is highest in nutrient value.

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Raking sunn hemp



Sunn hemp bale