

Maine Forage Facts: Sunn Hemp

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Introduction

Sunn hemp (*Crotalaria juncea* L.) is a fast-growing warm-season legume with relatively high biomass and nitrogen accumulation. It is a branched, erect, herbaceous, shrubby annual, growing 3 to 9 feet high with bright green, simple, elliptical leaves. It has deep yellow terminal flowers (open raceme to 10 inches long), and the light brown pods are small (1 inch long and ½ inch wide) and inflated. It has a well-developed root system with a strong taproot.

Sunn hemp is originally from India and was introduced in the United States in the 1930s to supply the fiber demand generated during the Second World War. It is used worldwide as a cover crop, green manure, or forage. Sunn hemp can fix nitrogen from the atmosphere, and its decomposition in the soil may supply nutrients for the companion or subsequent crop. Its flowers are also robust attractors of pollinators.

In addition, sunn hemp may suppress plant-parasitic nematodes such as root-knot (*Meloidogyne incognita*) and reniform (*Rotylenchulus reniformis*) nematodes by producing biochemicals that disrupt nematode life cycles. It is a non-host for nematodes and promotes the growth of antagonistic microorganisms and beneficial nematodes. Nematode pest populations can be reduced for several weeks after incorporation of sunn hemp into the soil. For those reasons, several vegetable and row crop producers use sunn hemp to decrease erosion and improve soil health.

Site Selection

Sunn hemp is a tropical or subtropical plant that grows as a summer annual in the United States. It is adapted to various soils but performs better on well-drained, sandy soils with a pH from 5.0 to 7.5.

Sunn hemp requires very little care and is fairly drought-tolerant. Planting when the soil is moist and warmer than 65 °F is best. Lack of water during the establishment phase can inhibit germination, plant density, and initial growth. If rainfall is insufficient, irrigating from seeding until two weeks after germination will aid in establishment.



Sunn hemp plants in the blooming period.

Soil preparation and establishment

Sunn hemp seed should be broadcast, drilled, and covered ½ to 1 inch deep into a well-prepared, weed-free seedbed to establish a successful stand. If broadcasted, seed at a rate of 40 to 60 pounds of live seed per acre. If drilled, the rate should be 30 to 50 pounds per acre in 6-inch rows. Higher rates should be used if the crop is terminated in less than 60 days or if severe weed competition is expected. Where weed competition is mild, drilled rates as low as 15 pounds of live seed per acre have been satisfactory. Inoculate with the cowpea-type rhizobia bacteria.

There are about 15,000 sunn hemp seeds per pound.

Sunn hemp can also be established with reduced tillage or no-till planting. However, careful weed control before planting is required. The same occurs with the application of fertilizers, lime, or manure.

Liming and fertilization

If used as a cover crop, fertilization, and liming are recommended to promote sunn hemp's accelerated growth and increase its competition against warm-season weeds. Fertilization usually promotes greater accumulation of soluble nutrients useful to the animal if used as forage. Phosphorous (P), potassium (K), and lime should be added according to soil test results.

Without a soil test, apply 30 pounds per acre of N, phosphate (P₂O₅), and potash (K₂O) per acre after germination.

Varieties

Sunn hemp seeds have been available in Maine for a few years, but the variety is usually not stated.

Tropic Sun: Released by the University of Hawaii and the United States Department of Agriculture (USDA) in 1982. This genotype has limited seed production and greater seed cost.

AU Golden and AU Durbin: Developed by Auburn University in 2002. Both cultivars may produce seeds in temperate climates.

In addition, other cultivars available in southern states are 'Crescent Sunn,' 'Ubon,' or 'Loei,'

developed in Ubon Ratchathani (Thailand), and 'Blue Leaf' from India. Currently, new cultivars are being tested in several places in the United States.



Sunn hemp flower raceme. Each floret measures approximately 1 inch and is very attractive for pollinators.

Productivity

In southern states, sunn hemp can produce up to 13 tons of dry biomass per acre, although 2 to 5 tons per acre may be more typical. In Maine, a first trial showed an accumulation of 1 to 2.5 tons of dry matter per acre at 60 to 90 days post-seeding.

Additionally, the above-ground parts of sunn hemp can accumulate up to 300 pounds of nitrogen per acre, although planting date and location affect nitrogen accumulation. The method used to mow and incorporate the crop can affect the decomposition rate and mineralization of nitrogen depending on how intact the crop biomass remains and whether it was left on the surface or buried. Although exact amounts of nitrogen available for subsequent crops vary widely depending on location and management factors, vegetable yields have been shown to respond favorably. Overall, nitrogen leaching can be reduced when sunn hemp is incorporated into the soil by increasing soil organic matter. However, nitrogen leaching may also increase shortly after termination due to rapid plant residue decomposition.



Height comparison of sunn hemp in Florida (a) and Maine (b). In southern states, sunn hemp can reach up to 6 feet tall at 60 days post-planting. In Maine, sunn hemp reached 4.5 feet tall at two months after planting.

Grazing management

Some varieties of sunn hemp produce harmful alkaloids (most highly concentrated in flowers, pods, and seeds), while others are non-toxic and make excellent forage. Tropic Sun is a standard variety that is safe for animal feed. AU Golden and AU Durbin have high leaf quality for livestock feed. Because leaves have greater nutritive value than stems, seeding at lower densities encourages high leaf-to-stem ratios and increases the forage value.

This legume can be used as feed for beef cattle and small ruminants by direct grazing or as cut-and-carry. Harvesting at the pre-blooming stage, usually 60 days after sowing, is recommended. This prevents sunn hemp from accumulating excess alkaloids or fibers that can reduce its nutritional quality.

Resources

2024 Maine Sunn Hemp Legume Variety Trials
extension.umaine.edu/publications/9642e/

References

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