

## MANAGEMENT

AND

USES

OF

SUNN HEMP

*Crotalaria juncea*

In Hawaii



## DESCRIPTION

Sunn hemp is an erect, branching annual legume. It is a rapid, vigorous grower, achieving a height of over 6 feet when grown under favorable conditions.

The plants are generally unbranched from ground level to approximately 2 feet. Above this height, many branches develop. The leaves are simple and elliptical in shape and are  $1\frac{1}{2}$  to  $4\frac{1}{2}$  inches long and  $\frac{1}{2}$  to  $\frac{3}{4}$  inch wide.

The flowers are bright yellow and develop on terminal racemes. The plant is cross fertilized by bees that pollinate the flowers. The dark, slate-green seeds develop in papery, inflated pods that are 1 to 1 $\frac{1}{2}$  inches long. There are about 15,000 seeds per pound. When the seeds mature, they rattle in the pod. Seed yields of over 2,000 pounds per acre have been recorded with accession HA-6.

Accession HA-6 has been tested for toxic substances and there are no known poisonous compounds in sunn hemp as in some species of *Crotalaria*. It is not an alternate host for any known diseases, such as the potato Y-virus, that affect commercial crops.

## ADAPTATIONS

**Climate:** Sunn hemp will grow well from sea level to about 2,000 feet. It is a warm-season plant and at upper elevations should be planted during the summer months. Below 1,000 feet, it will make good growth year round, although in the winter its growth will be limited to 3 or 4 feet in height. Sunn hemp is drought tolerant and will grow in areas with as little as 20 inches of rainfall annually. However, for maximum growth in low-rainfall areas and during periods of drought, the crop should be irrigated.

**Soils:** Sunn hemp makes good growth on a wide variety of soils ranging from sands to clays. Successful plantings have been made on slightly acid and neutral soils. Sunn hemp grows best on well-drained soils. Low-lying soils that tend to water-log should be avoided.

## USES

Green Manure: Sunn hemp is an excellent green-manure crop and is recommended for this use. Accession **HA-6** is reported to be nematode resistant, which makes sunn hemp valuable in vegetable growing areas where nematodes are a problem.

It should be included in a planned rotation with vegetable, ornamental or other crops when the addition of organic matter and nitrogen are desirable. Plantings should be made at regular intervals in a planned crop rotation, since an occasional green-manure crop will not make a great improvement in soil tilth or reduction in nematode population.

Sunn hemp will add approximately 50 pounds of nitrogen to the soil--per ton of dry matter produced--when plowed under. Under good growing conditions, it will produce 3 tons per acre of air-dry material in about 60 days, which would add approximately 150 pounds of nitrogen per acre to the soil. The organic-matter content in the soil will be increased by about 0.4 percent.

Sunn hemp should **also** prove valuable as a bee-attractant plant for fruit crops. Its flowers attract the large carpenter bee (*Xylocopa varipunctata*) which is considered to be the main pollinator of passion fruit.

## ESTABLISHMENT

Sunn hemp is established by broadcasting the seed at the rate of 40 to 60 pounds per acre. If a grain drill is used, the seeding rate should be 30 to 50 pounds per acre in 6-inch rows. At this seeding rate, a thick stand that will smother out weeds will be obtained. The seed must be inoculated with "EL" inoculant to insure effective nodulation.

To insure success, the seed should be broadcast and covered or drilled about 1/2 to 1 inch deep in a well-prepared, weed-free seedbed. A soil test should be taken and the recommendations followed. Calcium and phosphate are needed for maximum production of sunn hemp. Soils low in these elements should be fertilized to meet the needs of the crop. For example, soils low in phosphate should receive an application of 300 pounds of treble superphosphate or 600 pounds of single superphosphate fertilizer per acre before planting.

Damping off seedling disease may be a problem during periods of high rainfall when the soil surface remains moist. This should not thin the stand too drastically if the recommended seeding rates are followed.

## MANAGEMENT

Irrigation should be applied as necessary to promote rapid germination and growth. Sunn hemp needs a minimum of 1 acre-inch of moisture per week for maximum growth.

After a good stand is obtained, the most important aspect of management is in the timing for plowing the crop into the soil. Under no circumstances should sunn hemp be allowed to grow beyond the full-bloom stage when grown for green manure. The crop should be plowed down when in the bud or early flowering stage. This normally will be about 60 days after planting and the plants will be 4 to 5 feet tall. If allowed to grow beyond this stage, the plants will become woody and will be very difficult to plow under.

When turned under at or before bloom stage, nitrogen content will be high and decomposition rapid. This is important when a maximum quantity of nitrate is desired immediately, as for truck crops.

Timing of plow-down is very important, especially in high-rainfall areas where too much soil moisture may prevent plowing at certain times. In this case, it is better to plow the crop under earlier than recommended if soil moisture conditions are favorable, rather than risk having the crop become overmature. Conversely, in low-rainfall areas, it may be necessary to irrigate before plowing in order to bring soil moisture to a favorable level.

Satisfactory methods have been developed to turn the crop under. These are: (1) Mow with a rotary or flail mower, disk and plow as soon as possible so the material does not get too dry--the chopped material plows easily when green, whereas it becomes light and tends to pile and drag in front of the plow when dry; (2) plow the erect, standing crop. A single plow will usually do a better job than multiple plows.

If the second method is used, the crop should not be lightly disked or otherwise laid down before plowing, as the sunn hemp will become tangled in the plow. Only very heavy disks will adequately chop mature sunn hemp plants. Rototilling is also not advised, as the plant material tends to ball up in the tiller tines.

Sunn hemp can be plowed down as early as 30 to 45 days after planting and still be a worthwhile green-manure crop. The plants will be 18 to 24 inches tall at this time. This may be important to growers who want to keep their land out of cash-crop production for the least possible time. Growers who prefer to plow sunn hemp 30 to 45 days after planting should increase the seeding rate to 60 pounds per acre. At this young stage of growth, plowing is easily accomplished by using conventional disking and plowing methods.

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