



Big Trefoil, Greater Lotus

Lotus pedunculatus (syn. *L. uliginosus*)

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Big trefoil is a non-twining, perennial legume that grows better than most legumes under low fertility soils.

It is used as a cover crop, often planted with grasses, in fruit and nut orchards. Vegetable seedlings can be planted directly into an established big trefoil cover crop, helping to suppress weeds, control erosion and improve soil fertility.



Characteristics

Big trefoil is a low growing legume, spreading by numerous stolons and shallow rhizomes. Stems reach 36 inches (1 m) in length or longer and grow along the ground, rooting at the nodes when in contact with the soil.

The leaves consist of five small leaflets; three at the tip of the leaf and two close to the base of the leaf. It produces clusters of bright yellow, pea-like flowers.

The pods of big trefoil are 1 - 1 1/2 inches (2-3 cm) long and contain very small olive-green seeds. One pound of seed will have approximately 1 million seeds.

Grasslands Maku is a selected cultivar with increased vigor, drought tolerance and hardiness.

Big trefoil thrives in a wide range of soil types, from poorly drained swampy, acidic soils to sandy alkaline soils.

Environmental Requirements

Big trefoil is best adapted to areas receiving an annual rainfall of 50 inches (1270 mm) or more, which is well-distributed throughout the year. It grows best in areas with mild temperatures.

It can withstand long periods of surface flooding by fresh or slightly salty water. It is not very tolerant of drought.

It grows well in coastal lowlands, and can be grown in full sunlight or partial shade.



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Establishment

Big trefoil can be established from seed or by vegetative propagation.

• Seeding Rate

A seeding rate of 25 lbs/acre (11 kg/ha) is recommended.

Recommended seeding rates are based on the amount of pure live seed (PLS) found in a bulk seed order. This will ensure a good competitive stand that will suppress weeds. PLS is simply: (percent purity/100) times (percent germination/100). The actual seeding rate equals the recommended rate divided by PLS.

For example, a seed testing 90% purity and 50% germination equals a PLS of 0.45. In other words, out of 100 lbs of seed, only 45 lbs will germinate. Seed with a 0.45 PLS and a recommended seeding rate of 25 lbs/acre would have an actual seeding rate of 56 lbs/acre (25 divided by 0.45 = 56).

• Seed Treatment

Big trefoil seeds require no pretreatment. Germination takes place in 7 to 12 days after sowing.

• Rhizobium Inoculation

Nitrogen fixation and thus good growth occurs only when rhizobia bacteria are present in the soil.

Different legumes require different types of rhizobia. In many soils, rhizobia bacteria are absent or are not sufficient in either number or type. Under these conditions, it is necessary to inoculate the seed with rhizobia bacteria.

The common cowpea type rhizobia is not recommended. The rhizobia strains TAL 43, 187 and 925 were found to be highly suitable for big trefoil.

Seed should be coated with a sticking agent before the *Rhizobium* inoculant is applied. Vegetable oil (2 ml per 100 g of seed), sugar water (1 part sugar

to 9 parts water) and gum arabic are good sticking agents.

To apply rhizobia inoculant: 1) place the seeds in a bag or bucket with the sticking agent, 2) shake the bag gently or mix the seed until the seeds become completely covered, 3) add 50 g of inoculant per kg of seed, 4) and mix again until completely covered with inoculant.

Seeds should be sown as soon as possible after inoculation. If the seeds are left too long after inoculation, the rhizobia will dry out and die.

Seeds are difficult to handle and sow after inoculation, because they are sticky. To eliminate stickiness, add lime and mix well with the seed.

• Seeding Methods

For best results, drill the trefoil seed 1/2 inch (1 cm) deep into a weed-free, well-prepared seedbed. Seeds may also be drilled into existing residue or a killed sod.

If drilling is impossible, seed can be broadcast and covered or rolled. Care should be taken to cover the seed with soil, but not to bury them too deeply.

Irrigate as necessary to establish the cover. If irrigation is not available, be sure to plant at the beginning of the rainy season.

To achieve a rapid cover to suppress weeds during establishment, consider including a fast growing annual, such as buckwheat, in the seed mixture.

Use approximately half the recommended seeding rate for buckwheat and the full recommended seeding rate for big trefoil when sown together. When the buckwheat dies back naturally, the big trefoil will be established in a weed-free area.

• Vegetative Propagation

To establish big trefoil vegetatively, plant 4-8 inch (10-20 cm) length stem sections. Space the stem cuttings 10-15 inches (4-6 cm) apart to form a dense cover.

As with seeds, rhizobium inoculant should be added and mixed just before planting. Care should be taken not to prepare too much planting material at any one time, because the stem sections will dry out quickly.

Uses

- *Weed Control*

Vegetable seedlings and pineapple can be planted directly into an established big trefoil cover crop, helping to suppress weeds and improve soil fertility.

Big trefoil can also be grown around fruit and nut trees for the same purposes of suppressing weeds and improving soil fertility.

- *Soil Improvement*

Big trefoil is a nitrogen-fixing plant, and will increase the nitrogen content of soils. When big trefoil plants are incorporated in the soil, or die-back naturally, they decay quickly releasing nitrogen and other nutrients.

Big trefoil can be planted at intervals in rotation with crops and incorporated in the soil to keep the soil in good physical condition and a high state of productivity.

It can also be planted in strips within crop fields, rotating crop and legume strips after crop harvest.

- *Erosion Control*

Soil is often lost from hillsides, and along stream banks and irrigation channels. Big trefoil produces a long-lived, dense ground cover that protects the soil from high intensity rainfall.

Seed Sources

KM Seed
PO Box 929
Kamuela, Hawaii 96743 USA
Telephone: 808-885-4443

Frank Sauer & Sons Pty. Ltd.
P.O. Box 117, Rockhampton
Queensland, Australia 4700
Telephone: (079) 27 3333
Fax: (079) 22 2219

Rhizobium Sources

Nitragin Company
3101 West Cluster Avenue
Milwaukee, WI 53209 USA
Telephone: 1-800-558-1003

University of Hawaii
NifTAL Project
1000 Holomua Road
Paia, Hawaii 96779 USA
Telephone: 808-579-9568
Fax: 808-579-8516

Further Reading

Better Pastures for the Tropics. 1992. Frank Sauer & Sons Pty. Ltd., P.O. Box 117, Rockhampton, Queensland, Australia 4700

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