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# Factsheet

## A GUIDE TO PASTURE LEGUMES IN THE EASTERN CARIBBEAN

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**Improve  
YOUR  
pastures**

Livestock producers considering new pasture development or old pasture renovation cannot ignore the important role legumes have to play in any forage system for meat and milk production.

It is known that well adapted and productive legumes produce considerable amounts of their own nitrogen, thus reducing fertilizer nitrogen inputs. Furthermore, animals not only consume greater quantities of legumes than grasses but their voluntary intake of low quality grass herbage often present late in the wet season and in the dry season is increased as a result of the legumes present in the pasture.

The use of improved legume - based pastures is not a substitute for good pasture management. They must go together and this can only be implemented when animal numbers and their grazing habits are controlled.

### **DESMANTHUS SPP**

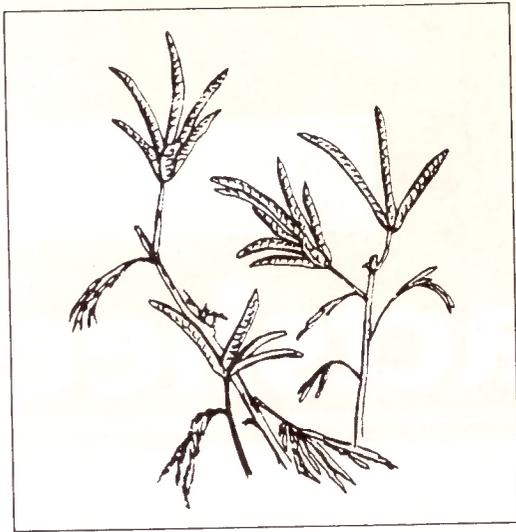
The most important species in this genus is *Desmanthus virgatus*.

It is a small shrub 2-3 m (6 - 10ft) tall, native to the tropics and subtropics of the New World from Florida to

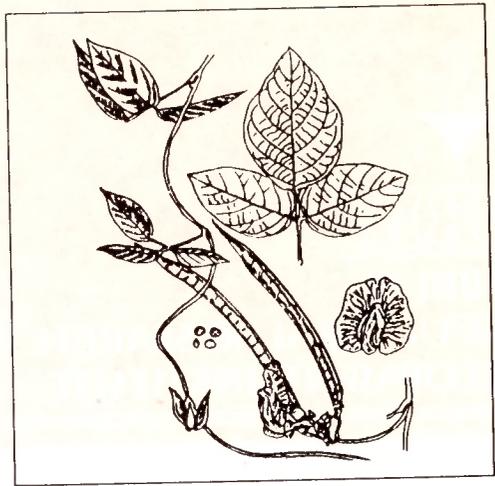
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*Desmanthus virgatus*



*Centro (Centrosema pubescens)*

Argentina. It is very similar in appearance to river tamarind (*Leucaena leucocephala*) but, it has a lower crude protein content than leucaena.

Currently available material is less productive in the dry season than selected leucaena varieties. However, new material now being tested in Australia shows sufficient promise to indicate that desmanthus could become more important in commercial agriculture than it is at present.

As a browse shrub, it has proved to be very palatable most of the year. It is well adapted to heavy, high pH calcareous clays and thrives well in areas receiving 1000 - 1500 mm (40 - 60 in) of rain annually. It is not aggressive in mixed stands, consequently it is better to plant in pure stands or in association with the bunch-type grasses (guinea or elephant) rather than the creeping types.

The plant seeds well and for establishment of small areas, it is best to germinate in pots and transplant after two to three months. Seeds can be successfully drilled at the rate of 2-3 kg per ha (2-3 lb per ac) when establishing large areas. The seed should be planted in well prepared seedbeds at a depth of not more than 1.0 cm (0.5 in).

Mature woody plants lose much of their ability to recover when they are cut back to a low level. Recovery then depends mainly on new seedlings from the copious seed shed from mature plants.

Like most other "browse type" legumes desmanthus can be managed as a herbaceous legume by cutting or grazing at the immature growth stage. This results in the maintenance of a viable "crown" area from which new shoots continue to grow following cutting or grazing.

#### **CENTROSEMA SPP**

This genus of 40 - 50 species is native to the American tropics. The most important is *C. pubescens*.

Centro is a creeping, twining, perennial legume that grows and yields best in areas receiving over 1250 mm (50 in) of annual rainfall. It is noted for its good rooting system and its ability to withstand a relatively long dry season. Unfortunately it does not do very well in areas that experience less than 1000mm (40 in) of rain per year. Centro is not suited to high pH, shallow, calcareous soils in the dry areas (less than 1000 mm) of the region.

Centro is a quick growing legume suitable for grazing and can be broadcast and harrowed, or drilled seeded at 5 cm (2 in) depth. Sowing rate varies from 3 - 5 kg per ha (3 - 5 lb per ac). It nodulates well in the Caribbean, without inoculation and fixes high levels of nitrogen under favourable conditions. Unfortunately it does not withstand prolonged grazing but persists very well if managed properly. Moderate grazing is recommended after the first year when lenient grazing is necessary to allow good plant establishment.

It is not very palatable in the wet season but is well utilized as the grass quality declines in the dry season. It grows best with bunch type grasses such as guinea and elephant.

It is not very productive during a prolonged drought but carries over well from the wet season as emergency good quality feed for the dry season.

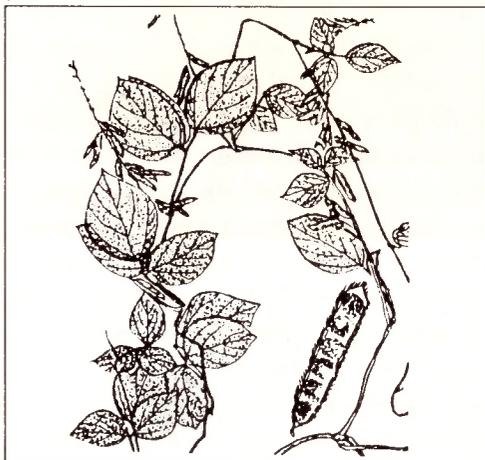
Centro is most commonly used for grazing but it is also suitable for hay and silage production. High leaf loss, however, is a problem in hay making.

Recently, other *Centrosema* species (*C. macrocarpum* and *C. acutifolium*) have shown promise on acid soils in the region.

#### **GLYCINE SPP**

This is a small genus of about 10 species found in the West Indies, Tropical Africa and Asia. The important pasture species is *G. wightii*, which is a deep rooted, trailing/climbing perennial legume originating from Africa. It

is a slender plant whose long trailing stems have the capacity for rooting down. It is clearly related to "rabbit vine" (*Teramnus labialis*) but considerably more productive in the dry season. Its leaves have fine short hairs on the undersides and the flowers are small and white.



Glycine (*Glycine wightii*)

Glycine is one of the most productive and persistent herbaceous legumes for the Eastern Caribbean. It is better suited for the heavy cracking clay soils than siratro (*Macroptilium atropurpureum*). On the other hand glycine is not very productive on the shallow, calcareous soils in the low rainfall areas (less than 1000 mm).

Glycine is more difficult to establish than siratro because the seed is only half the size, seedling vigour is much less and nodulation is more delayed. Consequently it is more susceptible to weed competition.

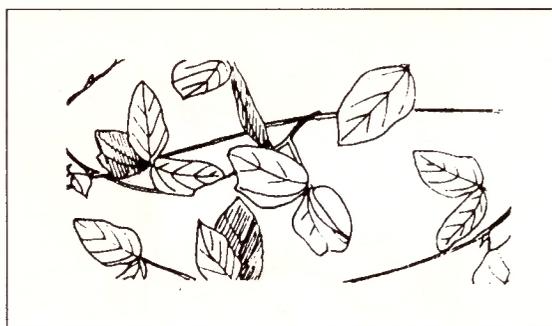
The plant is drought tolerant and may be grown in areas receiving more than 750–850 mm (30–34 in) rainfall annually. It does not like high rainfall of over about 1800mm (72 in). However, it grows well on heavy clay soils provided they are not waterlogged for long periods.

Glycine is best established from seed. Because of the high degree of hard seededness scarification just before seeding is advisable. Ideally, seedbeds should be thoroughly prepared for optimum germination and plant establishment; however, reasonable success is possible with minimum tillage or even with direct drilling (sod seeding). Oversowing is very risky and a practice that cannot be recommended.

The seeding rate for glycine is 2–4 kg per ha (2–4 lb per ac). The scarified seed should be planted at a depth of 1.0–1.5 cm (0.5–0.75 in). It is suited both to pure stand or mixed with grasses. Glycine grows well and is very productive in association with a wide range of grasses of both bunch and creeping types.

#### MACROPTILIUM SPP

A genus of two species native of central America. Both species are utilized in pasture production.



Siratro/Mexican macro (*Macroptilium atropurpureum*)

*M. atropurpureum* is a perennial legume which occurs naturally in central and south America and is probably the most versatile tropical forage legume. Both siratro the Australian variety and Mexican macro (Yucatan 61) the Cardi collected variety have been introduced into the region.

It is a hardy plant with persistence under dry conditions. It also stands up well to moderate grazing. Research has found that long term persistence of this legume has seldom been recorded when more than two animal units per ha (0.8 animal units per ac) is carried year round. The key to successful long-term siratro based pastures is deferred grazing in the first year to allow a crop of seeds to be shed onto the soil for future replacement needs.

Areas receiving more than 750 mm (30 in) rainfall annually can use siratro as long as soil drainage is good. However, this legume does best in wetter areas, 900–1500 mm (36–60 in) annual rainfall. Siratro is very well adapted to high pH soils and can be grown in pure stands or in association with glycine and/or with various grasses.

Siratro is readily established from seed. It has the great advantage of being easier to establish in marginal seedbeds i.e. rough or minimum tilled. Furthermore siratro can be successfully oversown or overdrilled (sodseeded). Seeding rate is 2–3 kg per ha (2–3 lb per ac); drilled to a depth of 1.3–2.5 cm (0.5–1.0 in).

#### TERAMNUS SPP

This is a genus with four species distributed in tropical Africa, southeast Asia, northern south America and the West Indies.

*Teramnus labialis* (rabbit vine) is familiar to most everyone in the region. It is fairly drought tolerant and will grow in areas where annual rainfall is 1000 mm (40 in) or more. It is considerably less productive in the dry season than either siratro or glycine and it is very well adapted to heavy cracking clay soils. Local "rabbit vine" produces small white flowers and a profuse crop of seed pods which turn dark brown or black when ripe.



*Teramnus labialis*

*Teramnus* is best established from seed. The seed should be sown at the rate of 2–5 kg per ha (2–5 lb per ac) and at a depth of 1.0–1.5 cm (0.5–0.75 in).

Forage production in its first year is low but as it becomes better established its productivity and persistency increase. It will withstand overgrazing better than either siratro or glycine and in mixed stands with grasses the proportion of rabbit vine can be increased with hard grazing. One reason for this is that it has a deep crown with buds that remain protected below the level of grazing. It also makes excellent hay and silage.

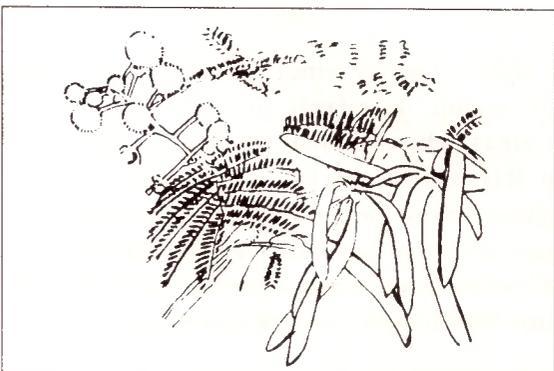
Rabbit vine grows well in combination with such bunch-type grasses as elephant and guinea. It also associates well with creeping grasses like pangola, star and the Bermudas.

In a number of countries, a mixture of siratro, glycine and rabbit vine, planted in the ratio of 2:2:1 by weight has resulted in versatile, productive and persistent grazing pastures when sown with grasses such as guinea, star, Bermuda etc.

#### LEUCAENA SPP

This genus of 50 species occurs almost exclusively in tropical America. The important pasture plant is *Leucaena leucocephala*, which is a perennial, leguminous shrub. It is a deep rooted shrub or tree which may grow to 10–20m (35–70 ft) if unchecked by grazing or cutting.

Leucaena is suited to well drained calcareous soils receiving more than 750 mm (30 in) rainfall annually. It is less tolerant of acid or poorly drained soils than most tropical legumes.



River  
tamarind  
(*Leucaena  
leucocephala*)

Leucaena is a very vigorous plant producing high yields of quality protein. It is best suited for incorporation in pastures where the leucaena makes up about 10% of the area of the field. This is quite sufficient to maintain animals on a protein-adequate feed.

The leaves and young stems are readily consumed by browsing animals. Thus the plant should be established in banks or hedges. When establishing protein banks the plants should be spaced 1m (3 ft) between plants within the row and 2 m (6 ft) between the rows. If the bank is being direct seeded the seed should be planted at a rate of 4–7 kg per ha (4–7 lb per ac) depending on row spacing and at a depth of 2.5 cm (1.0 in). On the other hand for small areas it may be preferable to plant leucaena seedlings in the field. If this is the case then the seedlings should not be transferred until they have nodulated and reached a height of 15–30 cm (6–12 in).

Since leucaena seedlings tend to be slow growing, weed control in the first year is very important. Mechanical control is the best method for weed control; however, once the plants have grown over the weeds then chemical weed control can be instituted.

Improved varieties such as Cardi Cunningham can produce 2.5–4.0 tonnes of crude protein per ha (1.0–1.6 tons per ac) per year. This is the variety presently being established in the region.

Vegetatively planted grasses (star, Bermuda, pangola) can be established between the rows of leucaena at the time of sowing. Alternatively, guinea grass can be seeded between the rows of leucaena when the leucaena has become established. On the other hand, if leucaena is introduced in cultivated strips into existing grasslands then the existing grasses can be used.

Leucaena should be grazed lightly until a good framework is established. Initially it should be grazed when about 1.5 m (4.5 ft) high and then grazed back to half its height to stimulate lateral branching from the base. In the second or third year the stand should be ready for regular grazing on a rotational basis.

Leucaena is indeed a very versatile forage crop. In addition to being browsed, it can be cut high or low and fed green or dry. Because of its versatility leucaena fits into a protein-energy bank forage system very well. Guinea grass is the grass of choice to plant with leucaena in these protein-energy banks. Four rows of guinea grass to one row of leucaena is the best combination in the protein-energy bank.

These stands can then be grazed, preferably on a rotational basis or cut and fed as green chop (forage).

For further information consult Cardi Bulletin No. 9 *Leucaena: A Versatile plant.*