

## **Mulch Systems - Velvetbean (*Mucuna*) Maize System**

**One of the first reports found in the literature on the use of velvetbeans (*Mucuna* spp.) in a mulch system in Central America was by William E. Carter in 1969 describing the use of velvetbeans as a mulch in the lowlands of Guatemala by Kekchi Indians, a Maya group that had migrated from the highlands of Guatemala.**



**Maize growing through mucuna mulch (mulch being shown by farmers) (Picture courtesy of Roland Bunch)**



**Planting maize in slashed mucuna mulch with dibble stick (Courtesy Milton Flores -**

## CIDICCO)

Although most agriculture in this lowland region used the slash-and-burn system for their maize plantings (*milpas*), in the dry season fields were often planted to velvetbeans. Carter wrote that the technique was to dibble a shallow hole and drop seeds three at a time into it, spacing the hillocks some 4 varas (83.5 cm) apart. After two months of growth, velvet beans began to have drastic effects on the *milpa*. Where weeds, grasses, and small trees have begun to take hold, it gradually covers them and chokes them out. Within six months, mucuna yields a thick cover of dark green leaves that can reach up to 8 feet in height. Once the luxurious growth of the velvetbeans reached a height of 2.5 meters the Kekchi slashed the growth with machetes and chopped it up finely. The result was a mulch 8-10 cm thick of the decayed velvetbean vegetation on the soil. Carter claimed that plots planted to velvetbean did not revert to grassland or forest, and that some plots had been used consecutively for 14 years of dry season farming with little indication of diminishing fertility. These observations were an early indication of the possibility of sustaining soil fertility in the lowland tropics with the velvetbean or other cover crop systems for long periods of time with a minimum of inputs.

**Mucuna growing over mature maize (Courtesy  
Milton Flores - CIDICCO)**



Walking through mucuna mulch  
(Courtesy Milton Flores - CIDICCO)

Regarding the system in Honduras Milton Flores of [CIDICCO](#) wrote: "Farmers using velvetbean for the first time, plant the legume 1-2 months after planting corn, at the beginning of January. Later on, when corn is harvested, its stalks are bent over and left on the fields. Velvetbean starts covering these stalks and soon the legume will take over the whole corn field. By December the large amounts of velvetbean foliage (varying from 50-70 mt/ha) begin to dry out until it finally ends on top of the ground providing a cover that can be up to 20 cm thick. This means that the next corn crop is planted directly through the mulch. The mulch suppresses weeds and allows an adequate establishment of the corn. During the second year, velvetbean seeds will volunteer from last year and the cycle continues with the planting of a new corn.



**Even without chemical fertilizers, maize yields of 2-4 tons per hectare were obtained using the above system, more than double the national average yields for Honduras. Hillside erosion was also reduced in the region. By adopting the velvetbean system, rather than plowing fields, farmers have essentially changed to a more sustainable no-till system.**

**CIDICCO indicated that velvetbean foliage was often slashed to plant a second crop of maize, and then incorporated or left as a mulch. Although incorporation would clearly reduce loss of nitrogen due to volatilization, peasant farmers in Honduras, preferred to mulch.**

**More pictures on mucuna (click on the picture for a larger image) :**

**\*Some of the pictures below were prepared by Christine Stockwell or Lucy Fisher.**



**Steep hillside planted to mucuna in Honduras (Picture courtesy Bernard Triomphe)**



**Field of mucuna (Courtesy Milton Flores - CIDICCO)**



**Immature mucuna pods (Courtesy Milton Flores - CIDICCO)**





**Three colors of mucuna seeds (Courtesy Milton Flores - CIDICCO)**



**Organic matter produced by mucuna (Courtesy Milton Flores - CIDICCO)**