Gliricidia sepium: a promising legume tree for the brazilian semiarid zone

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Abstract: In the Brazilian semiarid, there are recommendations for the cultivation of gliricidia to use as protein banks, in association with forage cactus, maize, bean, use as live fences, and as preserved forage such as hay and slage. A successful strategy is its cultivation in aphis in association with grasses for direct browsing. Integrating gliricidia into grazing systems increases carrying capacity of the pasture and promotes greater animal performance, being equivalent to N fertilization applied in the grass monoculture pastures. Gliricidia slage or hay can substitute about 30% of the concentrate feed in lamb’s diet without altering their live weight gain. These findings confirm the importance of gliricidia for the Brazilian semiarid livestock production.

Keywords: Integrated crop-livestock systems, protein banks, forage conservation.

Introduction

Gliricidia sepium, Jacq. Kurth, Wall. or gliricidia as it is commonly called in Brazil, is also known as “mata rato” in Honduras, “nuneo negro” in Costa Rica, “mata” integrated systems (8), and animal feed (7). In the present review, we compared the results obtained for this region. For semi-arid conditions, gliricidia is recommended for protein banks, in a consortium with forage cactus, maize, and bean, living fences, and as preserved forage (9). Gliricidia can be cultivated in aphis in association with grasses for direct browsing (1). This strategy was developed for coastal areas but can also be used in the semiarid conditions.

One of the important points for the sustainability of gliricidia crop is its harvest management. The resting period between each harvest and deterioration intensity will influence the speed of regrowth. In our studies, we have worked with spacing of 10 m between rows and 30 and 35 cm between plants in the row, resulting in populations between 28,000 and 36,000 plants/ha, depending on the availability of water and soil fertility. In sites or years with greater rainfall and more fertile soils, wider spacing between plants in the row is recommended and the opposite for sites with lower rainfall and poorer soils (Table 1). Data of tender and edible stems are not presented in Table 1. The number of cuts/year will vary mainly due to water availability.

Brazilian experience

In Brazil, the results of research carried out with this legume have caught producer’s attention. Most research was carried out in northeastern Brazil on green manure (6),
Table 1. Productivity and chemical composition of *Glicididia sepium* at different cropping years. Adapted from (9).

<table>
<thead>
<tr>
<th>Rainfall (mm/year)</th>
<th>Total edible yield t/ha/year</th>
<th>Leaf Fresh Biomass yield t/ha/year</th>
<th>Leaf DM Yields %</th>
<th>Leaf DM %</th>
<th>CP Leaves %</th>
<th>NDF Leaves %</th>
<th>ADF Leaves %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>106</td>
<td>69</td>
<td>20.1</td>
<td>13.8</td>
<td>22.3</td>
<td>35.8</td>
<td>26.3</td>
</tr>
<tr>
<td>2011</td>
<td>90</td>
<td>61</td>
<td>20.5</td>
<td>12.5</td>
<td>22.9</td>
<td>34.9</td>
<td>26.9</td>
</tr>
<tr>
<td>2012</td>
<td>71</td>
<td>42</td>
<td>25.2</td>
<td>10.5</td>
<td>22.0</td>
<td>33.7</td>
<td>26.3</td>
</tr>
<tr>
<td>2013</td>
<td>107</td>
<td>75</td>
<td>19.8</td>
<td>14.8</td>
<td>23.4</td>
<td>34.6</td>
<td>25.4</td>
</tr>
</tbody>
</table>

Figure 1. *Glicididia sepium* intercropped with polisadegrass (*Urochloa brizantha*) for onsite browsing.

or as hay or silage. In a study carried out to replace concentrate feed for Santa Inês lambs, we found that silage or glicidida hay can substitute about 50% of the concentrate feed without altering the lambs’ average weight gain that was 210 g/day (10).

Glicidida has been used in direct grazing systems, increasing pasture carrying capacity and promoting greater animal performance, equivalent to N fertilizer applied to the pasture. In an 11-yr study by Embrapa in a dystrophic yellow soil of the coastal tabuleiras, livestock gains were 685 kg/h/yr in the intercropping system of polisadegrass and glicidida against 495 kg/h/yr for polisadegrass in monoculture fertilized with 240 kg N/ha/yr. In this system, glicidida was cultivated in single rows spaced 5 m apart and 2 m between plants in the row (Figure 1). The great advantage of the polisadegrass intercropping system with glicidida over the monoculture system is during the dry season, when grass availability mass is low and the glicidida biomass remains high.

In crop-livestock-forestry integrated systems, glicidida has been used in several associations, cultivated with corn, forage cactus, polisadegrass, citar, and coconut trees. In the case of the forage cactus, glicidida not only adds N to the system supplying N to the cactus, but also provides high-quality fodder for the animals. Glicidida will supply the protein fraction of the diet and the cactus the energy fraction (Figure 2a). In reports with coconut trees, besides being harvested and used by animals, glicidida still increased coconut production by the incorporation of the biologically fixed nitrogen in the soil (Figure 2b).
Perspectives

Having in mind its great adaptability to different climatic and soil conditions, various micro-regions of the Brazilian Northeast, together with high forage value, *Gliciridia* is a strong ally in the search for economic alternatives, to complement the current diets, especially in the semiarid conditions. In addition, it has shown to be very efficient in the composition of crop-livestock-forest integration systems, increasing the nitrogen input in soil and providing shade and feed to the animals.

There is currently a great demand for information on cultivation technologies and use of *Gliciridia* by farmers and technical assistance agents. Although many technologies are already available to meet most of those demands, the lack of a recognized quality seed production and distribution system has been the main bottleneck for the expansion of this crop. Such lack is mainly due to the absence of registered cultivars of this species. In this sense, Embrapa initiated a selection program of *Gliciridia* accessions, aiming at the registration and market launch of cultivars with proven agronomic performance.

![Gliciridia integrated with forage cactus, and B) with coconut trees.](image)

References


