Tropical Grasslands-Forrajes Tropicales (2019) Vol. 7(2):141–142
DOI: 10.17138/TGFT(7)141-142

ILC2018 Poster and Producer paper*

Leucaena as forage in northeast Africa

Leucaena como recurso forrajero en el noreste de Africa

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Keywords: Establishment, genetic material, tree legumes, utilization.

Introduction

Leucaena is naturalized throughout northeast Africa, and is continuing to spread. It is spectacularly productive in many areas, including Western Eritrea (Figure 1), the fertile mid-elevation areas of Ethiopia (Figure 2), parts of the Rift Valley, the shores of Lake Victoria and the flood plains of Somaliland and Somalia, with neutral to alkaline soil pH being a major factor in successful adaptation.

Figure 1. Leucaena with occasional irrigation, Western Eritrea.

Genetic material

The genetic material is diverse, from woody heavy-seeding types to those with excellent forage potential. Unfortunately, there has been some indiscriminate promotion of species, including *Leucaena trichandra* and *L. diversifolia*, on the basis of agronomic adaptation, without any cognizance of the importance of forage quality and therefore potential for livestock production. In addition, unsupervised seed collection has often resulted in a shift to material with inferior forage production. Promising cultivars, including Tarramba and Wondergraze, have been introduced. Major development programs can be based on these introduced cultivars or on the use of carefully selected naturalized material.

Figure 2. Leucaena spreading on roadsides in West Ethiopia.

Establishment

There are some major intensive initiatives encompassing leucaena. Ethiopia's Sustainable Land Management Program has generated many millions of seedlings in hundreds of government, communal and private nurseries, which also produce a wide array of other species, primarily for establishment on communally managed stock-exclusion areas, which are open to cut-and-carry management, but also on individual smallholdings. Some current programs in

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*Poster presented at the International Leucaena Conference, 1–3 November 2018, Brisbane, Queensland, Australia.

Somalia and Kenya are promoting the intensive production of leucaena on smallholder farms, based on bare-root/bare-stem seedling production to generate seedlings 1–1.5 m tall. In most nurseries traditional approaches have generally been used, with production of small seedlings in tubes or bare-root systems. There are some current initiatives in broad-scale establishment on commercial farms, with direct seeding. However, even on these farms, given the very low labor costs, transplanting of large bare-root/bare-stem seedlings may be cost-effective, and would allow more-timely establishment, which is crucial with shorter growing seasons. There has been very little use of specific rhizobium inoculants.

Some other interventions have been undertaken. In the 1980s in Ethiopia, tonnes of seed were harvested at about US$0.15 per kg, with collection sites selected for high leaf production. This low seed cost enabled broad-scale seeding on miscellaneous sites including roadsides, aerial seeding on degraded slopes including limestone soils in the tributary gorges of the Blue Nile, sowing into sites heavily infested with weeds such as *Lantana camara* and inclusion in conventional pasture mixes. All programs resulted in successful establishment and persistence on suitable soils, and have contributed to continuing rapid colonization. Productivity has been constrained primarily by grass competition, which is not a major issue in most target areas; persistence under very heavy grazing pressure has generally been excellent.

Utilization

Historically, utilization has been sub-optimal, although leucaena's role in dry season feeding is widely recognized by smallholder farmers. With rapidly increasing land pressures, there is a shift towards more intensive utilization, and maintaining regularly-cut hedges. Farmers appreciate the additional benefits from the provision of shade and firewood. In some more-intensive systems, the role of leucaena in improvement of soil fertility in cropping systems is also recognized.

Other issues

Infestations of psyllids (*Heteropsylla cubana*) occur for only short periods in most areas, and do not justify any strong emphasis on the introduction of psyllid-tolerant genetic material.

There are no areas, currently, where the levels of use are likely to lead to mimosine toxicity. However, recent initiatives in promotion of more intensive systems will probably require greater attention to management of leucaena toxicity.

The future

Leucaena should be promoted much more widely throughout the region. There is no need for additional conventional research, although visual ranking of performance in wide-ranging environments should be routinely undertaken. Agencies (including ILRI and ICRAF) and other development groups need to ensure the promotion of superior material, and much greater care needs to be taken in local collection of seed, where emphasis must be on trees with high edible forage production. Accessions adapted to specific environments, including degraded sites with low rainfall, need to be selected and multiplied.

In intensive small-scale programs, bare-root/bare-stem nursery systems can be more widely used.

In most parts of the region, it is still feasible to produce seed at less than US$1/kg. Seed production programs should be initiated to provide large volumes of seed for use in diverse establishment systems, including direct seeding within livestock exclosures.

Leucaena should always be promoted in conjunction with other forage genetic material.

There is a major need for effective networking, with exchange visits to areas where leucaena is already playing a major role in livestock production and improved land management.

(Accepted 20 March 2019 by the ILC2018 Editorial Panel and the Journal editors; published 31 May 2019)