

Tree with great potential

The future looks bright for cultivation of *Acacia senegal*, which produces gum arabic



Gum arabic

By Ben Chikamai

The inaugural issue of *Miti* (Issue No. 0001) carried an article on *Acacia senegal* as one of the resources with potential for commercialisation in Kenya for improved rural livelihoods. *Acacia senegal* is the main source of gum arabic, a substance of commercial value in the food and pharmaceutical industries since Pharaonic times, and which remains important even today.

Although substitutes have been introduced, gum arabic has remained the most important of the exudative gums. In some applications, it has superior technical attributes, which make it difficult to substitute completely, especially in the food and pharmaceutical industries. Its high solubility in water and low viscosity over a wide range of concentrations enhance its high value as an emulsifier and stabiliser. Rising health consciousness worldwide and the fact that gum arabic is becoming an important ingredient in functional foods, favour its increased consumption, and hence production.

Kenya is well endowed with *Acacia senegal*, which is widespread in the drylands. Three of the four varieties are grown in the country but it is mainly *Acacia senegal*



A. senegal var. *leiorachis*

var. *kerensis*, which produces gum arabic in commercial quantities. Studies are currently going on to establish the commercial viability of the other two varieties - *A. senegal* var. *senegal* and *A. senegal* var. *leiorachis*.

Although no detailed inventory has been carried out, previous studies, sub-sector analysis and scoping exercises reveal that northern Kenya has the potential for producing in excess of 10,000 tonnes of gum arabic per year from wild populations. Other dryland areas have the resources but environmental conditions are not always favourable for gum production.

Commercial production of gum arabic in Kenya started in 1990 when about four tonnes were exported by the Semi Arid Lands Training and Livestock Improvements Centres of Kenya (SALTICK) in Isiolo, to the UK. After that, a number of players entered the market and export volumes increased to a peak of 495 tonnes per year in 1995. However, export volumes declined thereafter and today stand at about 100 tonnes a year. Kenya has thus remained a minor producer

among the 14 African producing and exporting countries of gum arabic. The main reason for this is that the gum arabic from *A. senegal* var. *kerensis* is slightly more viscous and tends to form a gel at higher concentrations compared to the traditional one from *A. senegal* var. *senegal*. This presents challenges during processing, which makes traditional users opt for the latter. Secondly, harvesting and post-harvest handling needs to be enhanced to improve the quality of the product. Nevertheless, gum from *A. senegal* var. *kerensis* has comparable functional properties to var. *senegal* with unique niche markets in applications where adhesion is sought. Overcoming the high viscosity constraint during processing is a technological hitch that can be resolved.

Meanwhile, aggressive marketing by traders has opened up the domestic market and approximately 30 – 50 tonnes are sold annually, especially in the adhesive and printing industries with smaller quantities of mill-ground gum arabic being used in the food and pharmaceutical industries.

Prices are generally variable, especially for the export market. For example, in 2001/02 the price for gum arabic from *Acacia senegal* was about US\$ 1,500 per tonne, rose to about US\$ 4,500 per tonne in 2005/06 and stands at about US\$ 3,500 per tonne in the 2008/09 season. Production volumes in producing countries as well as the country of origin influence the prices, with Sudan attracting the highest prices. In Kenya, export prices have generally been low and vary between US\$ 1,200 – 2,500 per tonne. The main reason for the low prices is that Kenyan gum is slightly different, as explained earlier, but also because Kenya is a relatively new source.

Prices are generally variable along the value chain but floor prices to collectors vary between Ksh 30 - 50 per kilogramme (equivalent to US\$ 0.38 – 0.63 per kilogramme) **M**

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Acacia senegal var. *kerensis*



A. senegal var. *senegal*