

Agave industry for South Africa secured

CSIR: The Council for Scientific and Industrial Research (CSIR) in South Africa is one of the leading scientific and technology research, development and implementation organisations in Africa. It undertakes directed research and development for socio-economic growth.

The CSIR is contributing to the establishment of a new South African industry after securing funds for the establishment of an agave industry in South Africa. This industry promises to transform the rural economy and job creation for subsistence farmers and entrepreneurs in the Great Karoo and Lesotho.

The project value is just below R12 m, and CSIR Materials Science and Manufacturing has secured some 52% of the investment to be made. CSIR experts from the biosciences and natural resources domains are collaborating. External partners in the project are the Department of Trade and Industry, the Eastern Cape Development Corporation, Cacadu district municipality, textile and paper-manufacturing companies in South Africa, and international stakeholders in Brazil, Lesotho and Swaziland.

A recent presentation of the *Agave americana* project to the United Nations (UN) Inter-governmental Group on Hard Fibres, to high-ranking officials and technical specialists opened the opportunity to secure a lucrative contract of R16 m with the Common Fund for Commodities.

A. americana is commonly associated with liquor beverages, similar to tequila. Following a research study by the CSIR, it will soon be a coveted source of utilisation that ranges from paper-making, composites for the automotive industry to the pharmaceutical and food industries.

The CSIR found that all parts of *A. americana* can be used successfully for various applications. The 'zero-waste' utilisation of the plant would enable its production and processing to be translated into a viable and sustainable agave industry in South Africa.

The results of this research formed the basis for developing a general concept for commercialising the *A. americana* in the rural areas of the Great Karoo.

The Eastern Cape is particularly impoverished, with unemployment of 60 % in the Great Karoo alone. Land claims by emerging farmers are currently in progress, but the 5 000 h farms to be allocated will not be sufficient for economic independence without some crop cultivation. The climate and soil of the Great Karoo are not favourable for the cultivation of commercial crops.

The only plant of value that grows in the arid Karoo and that can also grow on

*'Batchos' (harvesters)
at work in a blue agave
field. In front is a cut 'pina'
(heart' of the plant)*



eroded soil is *A. americana*. In the early 1900s, agave plants were distributed throughout South Africa for erosion control and as a fodder crop during droughts.

The plant is currently already being used for the production of an alcoholic beverage by fermentation of the heart (pina) of the plant, chiefly for export purposes.

The *Agave* genus, comprising around 140 species, occurs and is cultivated in arid and semi-arid regions worldwide. This family includes leaf fibre plants, such as *A. americana*, *A. sisalana* and *A. tequilana*. Agave plants are native to Mexico and other parts of the Caribbean region. The best known and most common application of the *A. tequilana*, also known as blue agave, is the production of tequila from the sap of the pinas.

In the study done by the CSIR, *A. americana* leaves were randomly harvested in the Graaff-Reinet area and supplied to the CSIR for evaluation.

Tests were carried out with regard to the fibre contained in the plant, particularly fibre extraction, properties, processing and potential applications and agave fibre-based paper. Of special interest were also fructans and inulin investigated by CSIR bioscientists. Fructans are oligo or polysaccharides, which comprise at least two adjacent fructose monomers. Fructans have value in the health and food arenas, and occur in nature in a polydisperse form. Inulin has been successfully tested as a vaccine adjuvant.

From the CSIR study it was clear that *A. americana* fibre can be utilised for the production of nonwovens. Two main applications identified are geotextiles and composite materials for the automotive industry.

The pina of the *A. americana* contains up to 25% inulin, while the leaf base of the local *A. americana* contains up to 16% fructans. Both the pina and leaf base can be utilised for the commercial production of long-chain inulin and fructans, which have applications as vaccine adjuvants in the pharmaceutical industry and fat substitutes and low calorie sweeteners in the food industry, respectively.

Pina waste and short-fibre textiles are suitable for small-scale and commercial paper-making.

The CSIR results could result in the birth of a new industry in South Africa, transformation of the rural economy and job provision for hundreds of subsistence farmers and entrepreneurs in the struggling Great Karoo.

Source: http://www.csir.co.za/enews/2008_may/msm_01.html