



International Center
for Agricultural Research
in the Dry Areas

Encouraging Cactus Pear production in South Africa

BRIEFING



In addition to its use as a livestock feed, Cactus Pear is increasingly being cultivated for human consumption.

Increasing demands on already scarce water resources in South Africa require alternative sources of animal feed – specifically crops that are more efficient users of water. One alternative with the potential for widespread production is spineless Cactus Pear. This plant is now being promoted across South Africa as a versatile crop with multiple applications.

Cactus Pears are used for a diverse range of applications in South Africa. Long exploited as a source of animal feed, recent decades have seen increasing interest in various other potential uses – from medicinal products to food for human consumption. Research suggests that the economic benefits of Cactus Pear production could also be significant: a recent study demonstrated that young plants pruned to stimulate fruit quality were capable of yielding 8000 kg of cladode dry matter per hectare after only four years.

Processing cladodes for livestock feed

During the previous century the cactus pear variety *O. robusta* was officially promoted in South Africa as a standing fodder bank to sustain livestock through periods of drought. The new emerging cactus pear industry, however, is now based on spineless *O. ficus-indica* varieties. A resource base of 42 different *O. ficus-indica* varieties has been evaluated for fruit and cladode yields in different agro-ecological areas of the country.

O. ficus-indica plants yield significant quantities of fresh cladodes, which are processed to form the basis of balanced diets for livestock. Processing involves sun-drying and coarsely grinding the cladodes, which reduces water content, makes the material less bulky, and thereby facilitates transport, storage, and ultimately, incorporation into livestock diets. Studies suggest that Cactus Pear has the potential to provide some 25% of the basic feed resources required by South Africa's commercial ruminant feed manufacturing sector.

Processing fruit and cladodes for human consumption

In addition to its use as a livestock feed, Cactus Pear is increasingly being cultivated for human consumption. Although the plant can be consumed fresh as a juice or vegetable, significant value can be added through processing. This potential is considerable: the plant can be pickled; preserved as a jam or marmalade; or dried and milled to produce baking flour.

The extraction of mucilage from fresh cladodes can also form a gelling, emulsifier, and fat-replacing agent commonly found in food products such as mayonnaise and candy. The extrusion of Cactus Pear seed oil provides a further lucrative niche product to the array of multi-uses - namely high-value organic oil for the cosmetic sector.



RESEARCH PROGRAM ON
**Climate Change,
Agriculture and
Food Security**



UNIVERSITY OF THE
FREE STATE
UNIVERSITEIT VAN DIE
VRYSTAAT
YUNIVESITHI YA
FREISTATA



Developing a viable Cactus Pear agro-industry

Although Cactus Pear is well-known to many South Africans, misconceptions about its potential persist. Efforts are therefore under way to revitalize interest in the plant's production, promoting a renewed awareness of its versatility and multiple applications. Exploiting various forms of media, a publicity campaign targeting farmers is providing information related to agronomy, Cactus Pear resources, fruit production, and the plant's potential as a source of food for both humans and livestock.

An agro-industry based on the cultivation of Cactus Pear is gaining momentum but its ultimate success will depend on a vibrant primary production sector - with producers operating at small (household) to large (commercial) scales. Farmers could participate in processing cladodes and fruits themselves or deliver produce to centralised processing facilities.

New orchards are now starting to yield cladodes and fruit in sufficient quantities to justify the acceleration of processing. After initial scepticism, there is a growing interest among public and private entities to invest in different processing options. However, reforms are required to ensure that an effective agro-industry based on Cactus Pear production can be developed and sustained over time – from the construction of new infrastructure to the provision of appropriate training needs.



Cactus Pear is processed to form the basis of balanced livestock diets. Processing involves sun-drying and coarsely grinding the cladodes, which reduces water content, makes the material less bulky and facilitates transport, storage, and incorporation into livestock diets.

Contact

Prof. Ho de Waal, University of the Free State, South Africa.
E-mail: dewaalho@ufs.ac.za

Dr. Maryna de Wit, University of the Free State, South Africa.
E-mail: dewitm@ufs.ac.za

Dr. Herman Fouché, Agricultural Research Council, South Africa.
E-mail: fouchehj@ufs.ac.za

Dr. Mounir Louhaichi, International Center for Agricultural Research in the Dry Areas (ICARDA)
E-mail: m.louhaichi@cgiar.org

Steps needed to develop a Cactus Pear agro-industry:

- Publicity campaigns to promote Cactus Pear's potential as a versatile and multi-use crop – exploiting various forms of media
- Source appropriate pathogen-free planting material to establish new orchards
- Identify partner communities and localities for a range of intensive to semi-intensive production options
- Develop the infrastructure necessary to establish Cactus Pear orchards – including protective fences that can reduce the threat of damage caused by wildlife and livestock
- Maintain and nurse Cactus Pear orchards, particularly aftercare to prevent the plant's two main pathogens – Cochineal and Cactoblastis – from gaining a foothold
- Annual pruning two years after planting can yield cladodes for various applications
- Develop new markets for a range of different products
- Train participants in the relevant aspects of processing Cactus Pear cladodes and fruits

The future potential of Cactus Pear production

Current initiatives promote Cactus Pear as a multi-use crop that can be used for livestock feed, seed oil, food for human consumption, and medicinal and pharmaceutical applications. In South Africa the outdated perception of Cactus Pears as thorny, alien invaders, is rapidly disappearing. Instead, farmers now recognise that Cactus Pear can play a vital role as a high yielding, water-efficient, multi-use crop.