

De-bushing
Advisory
Service



DO IT RIGHT

Bush-based Animal Feed



Producing bush-based animal feed is a clever and viable strategy for farmers. Is it really possible to feed woody material to grazers such as cattle and sheep? During the past drought, many Namibian farmers have tried and tested animal feed made from bush thickening species and have found out that, yes, bush-based animal feed works.

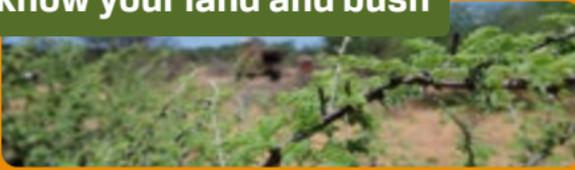
But you have to do it the right way!



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STEP 1

Know your land and bush



Know your land

- Farmers should know their resource base, manage their land for effective recovery, rest and enhance the condition of their soils.
- Observe your animals to find out which species they prefer. Commonly browsed bush species which have been tested for use as animal feed are *Mellifera* (Blackthorn, Swarthaak), *Dichrostachys cinerea* (Sicklebush, Sekelbos), *Terminalia sericea* (Silver Cluster Leaf, Vaalboom) and *Rhigozum trichotomum* (Three-thorn, Driedoring).
- Make sure to identify target species and avoid damage to protected trees. Use a field guide or the DAS bush species poster.
- Understand that producing animal feed from encroacher bush must be part of a longer-term strategy to restore rangelands.
- When regrowth occurs, the fresh sprouts can be utilised again for animal feed production. The bush stops coppicing after multiple sprout cuttings.

STEP 2

Obtain your permits



All harvesting of tree and woody species in Namibia is governed by the Forest Act and its Regulations. The Act states that anyone who partakes in harvesting, transport, marketing or exporting forest resources must be in possession of a permit issued by the Directorate of Forestry in the Ministry of Environment, Forestry and Tourism. Application forms for bush harvesting and processing can be found online at www.forestry.gov.na.

Specified activity	Required documents	Validity
Harvesting of timber, farming with bees, honey, wild fruits, medicinal plants, fencing poles and droppers, or firewood	<ul style="list-style-type: none"> Form 10 (application for a permit for forest produce) to be completed Form 12 (harvesting permit) to be completed 	<ul style="list-style-type: none"> A harvesting permit on communal land is valid for 7 days. A harvesting permit on commercial land is valid for 3 months.
Any activity that affects a state forest		
Production of charcoal, woodchips, firewood or animal feed		
Bush control	<ul style="list-style-type: none"> Form 7 (application for bush control permit) needs to be completed 	<ul style="list-style-type: none"> A harvesting permit is valid for 3 months
Transport, import, transit, export, selling or value addition of forest and / or bush-based resources	<ul style="list-style-type: none"> Form 10 (application for a permit for forest produce) to be completed Form 13 (transport) to be completed Form 14 (export) to be completed Form 15 (import) to be completed Form 16 (transit) to be completed Form 17 (marketing) to be completed 	<ul style="list-style-type: none"> Transport permit is valid for 3 days (for own use, on communal land); on commercial land it is 7 days Export and transit permit are valid for 4 days Marketing permit on communal land is valid for 1 month, on commercial land for 3 months

Source: MEFT Forestry Field Guide, 2020

Contact your nearest forestry office to consult and verify the necessary documentation for your permit requirements!

STEP 3

A good harvest



It is important to consider the most economical and environmental sound method depending on your specific project requirement.

- Manual harvesting with axes and pangas is the least costly method. For bush feed, only the thinner branches need to be chopped off. The producer can come back later and chop off the bigger branches for e.g. charcoal production or firewood.
- Semi-mechanised harvesting includes power tools such as clearing saws. These tools should only be used by skilled workers and investment into training and safety is important. Power tools have to be serviced regularly.
- For mechanised harvesting, front end loaders, loggers or excavators can be used. Manual or semi-mechanised operations work optimally for debranching.

Twigs, pods and leaves

- Select smaller twigs and branches, up to broom stick size. Only use flexible, living twigs carrying leaves. Younger bush is more nutritious with higher protein content.
- Thicker branches are highly lignified and difficult to digest. No branches over the diameter size of 2 cm should be used for bush feed production.



STEP 3

A good harvest



Know the right time

- It is best to produce when the bush has leaves, blossoms or pods.
- The main production time in Namibia is therefore between October and April, or before the first frosty days set in.

Know the size of your operation requirements

Small set-up

A set up with manual harvesting and a small hammer mill is ideal for small-scale operations. A small hammer mill can be operated by one person who can produce 3 to 5 bags of fibre per day, ca. 100kg. Such a hammer mill is available for around NAD 15,000. The fibre can be mixed into animal feed for own animals or sold to other farmers.

Medium set-up

When producing larger quantities, a bigger set-up is needed. For harvesting, power tools can be used. Chipping the bush before milling it seems to be more cost efficient in bigger operations. Note: the chipped fibre needs to dry first before it can be milled.

Large set-up

Some machine offers a one-step approach by first chipping, then milling and mixing. However, feed mixed in the large operations is most cost efficient when fed fresh.



STEP 4

Milling

- All bush must be milled into fibre before it can be mixed into fodder. Large livestock, like cattle need longer fibres; small livestock like sheep or goat need shorter fibres to maintain optimal rumen activity.
- Optimal is a fibre length of 30mm, and breadth of less than 1mm. For large stock, a 16mm sieve size can be used. For small stock, it is better to use a 6mm sieve.

Did you know?

Chipping of twigs makes handling easier,
but it is not necessary.

Milling of bush is necessary.
Animals can only chew milled fibre.

Lab Testing

Know what you have,
then you know what you need to add!

The laboratory at the Ministry of Agriculture, Water and Land Reform can test your bush and locally sourced ingredients. This is how to do it right:

Sample your bush

1. Harvest a lot of bush.
2. Put it through a hammer mill.
3. Dry your sample.
4. Sample from different bags: if you have 10 bags, take from 5 of them and mix in a bucket. Take 1kg from that bucket. That is your sample.
5. Put it in a paper or plastic bag.

Add information to your sample

- Name, address / area, phone / email
- What do you want to produce (number and type of animal)?
- What type of bush (you can use local names), date on which it was sampled?
- What locally sourced ingredients and / or agro-industrial by-products are you planning to use?

Drop and pay

You can drop your sample directly at the Ministry Laboratory (Government Office Park, Windhoek).

You will need to pay NAD 160.

You will be informed when your test results are ready!

STEP 5

Mixing



It is important to mix thoroughly the different components so that the animals do not pick out their most favourite ingredients.

Make your Mix

- Bush based animal feed usually consists of
 - a) Milled bush fibre
 - b) Locally sourced ingredients such as camelthorn pods, cactus
 - c) Agro-industrial by-products such as marula oil cake, bran and brewers' grains
 - d) Commercially sourced supplements
 - e) Ground mixing: Spread the fibres on the ground (on concrete or a sheet), sprinkle supplements on top and mix with hay fork
 - f) A concrete mixer can also be used to mix fibre and supplements

Know your supplements

Adding of supplements can be done with or without a pre-treatment of the milled bush. The below list is not exhaustive.

- Camelthorn pods flour is a source of protein
- Prickly pears, also known as *Opuntia* are a good source of carbohydrates energy
- Marula oil cake is a good fat and source of protein
- Yellow maize contains high starch content which makes it a good source of energy
- Molasses is primarily a source of energy and makes bush based feed more palatable
- Polyethylene glycol (PEG) counteracts tannins and improves digestibility of the feed
- Biochar counteracts the effects of tannin in the digestive system in the feed available to animals
- Sodium hydroxide (NaOH) breaks down lignin in the fibre and therefore improves digestibility
- Urea is a chemical source of protein



STEP 6

Feeding

Feeding

- If the farmer wants to feed on the same day, the fibre can be mixed freshly and then fed.
- Take note that animals prefer to eat a consistent diet, at the same time, every day, so it is best to develop an individual recipe and then stick with it in a routinely manner.
- Depending on age and feeding conditions of the livestock, the needed daily supply with bush based feed varies.

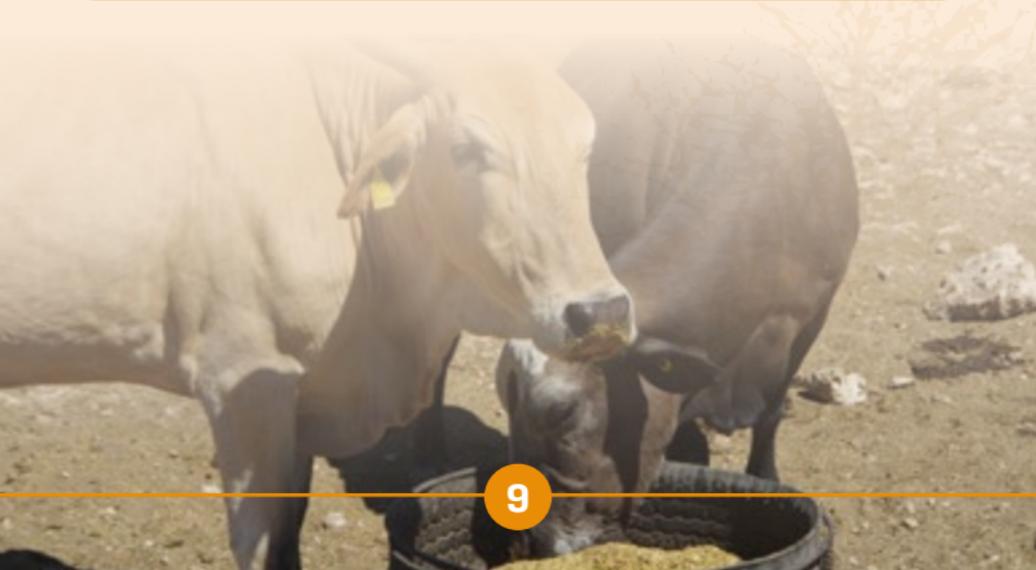
Did you know?

Weighing of the livestock is needed to ensure that they receive enough fodder consistently.

Recommendations for diet requirements can be found in the Animal Feed from Encroacher Bush Brochure on the DAS website at www.dasnamibia.org.

Did you know?

Bush based animal feed is not yet registered as a commodity product in Namibia. Anyone wishing to commercialise production should obtain a licence from the relevant authority.





STEP 7

Pelletising

Pelletising

- Pellets are easier to handle and to store.
- Most farmers agree that animals prefer pellets, probably because the heat generated in pelleting makes the feedstuffs more palatable.
- Pellets also ensure that each animal receives a well-balanced diet as the animal cannot pick and choose between ingredients.
- Pellets should not be stored longer than 6 months.

Did you now?

The earliest documented bush-based animal feed production in Namibia dates back to 1972.

Did you now?

About 600 livestock farmers in communal and commercial areas of Namibia were trained on bush feed production by DAS in 2019.





STEP 8

Storing

Storing

- If the farmer wants to store bush feed, the milled fibres must be dried first. Drying is important to prevent mould which will cause illness in animals.
- To ensure appropriate drying of bush fibre, spread out flat on a surface in a layer of not more than 10 cm thick. The drying fibre needs to be turned regularly.
- Under dry, sunny conditions, it should then dry in a day.
- In the rainy season it is best to produce fibre in the morning to give it a chance to dry before the rain comes. Drying fibres must be protected from rain.
- The storage facility should prevent direct contact with sun and moisture, be ventilated and provide protection from insects and rodents.
- Material should not be stored longer than over one winter season.



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Disclaimer: The recommendations in this leaflet are by no means the perfect recipe for bush feed production but rather a quick guide on how to do it the right way. It is strongly recommended to consult an expert before starting to produce and feed bush-based animal fodder. The publisher and implementing partners can not be held liable for the content herein.