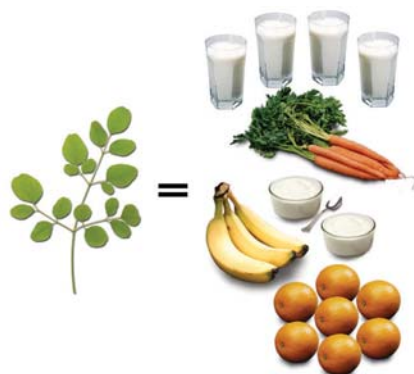


MORINGA OLEIFERA

What is this Action Sheet about?

This Action Sheet is about the remarkable drumstick tree, *Moringa oleifera*. It will tell you about the many uses of this tree, help you find out whether it grows well in your region and if so, how you can grow it yourself.

What is so good about Moringa?



There is an old saying: “*Moringa leaves prevent 300 diseases.*”

Now modern science is proving that these tiny leaves are packed with incredible nutrition that can strengthen our bodies and prevent many diseases.

The figures given here reflect gram-for-gram comparisons with Moringa leaves.

Moringa leaves have:

2 times the Protein of Yogurt - Proteins, the building blocks of our bodies, are made of amino acids. Usually, only animal products such as meat, eggs and dairy contain all of the essential amino acids. Amazingly, Moringa leaves also contain them all.

7 times the Vitamin C of Oranges - Vitamin C strengthens our immune system and fights infectious diseases including colds and flu. Citrus fruits such as oranges and lemons are full of vitamin C. Moringa leaves have even more.

3 times the Potassium of Bananas - Potassium is essential for the brain and nerves. Bananas are an excellent source of potassium. Moringa leaves are even better.

4 times the Vitamin A of Carrots - Vitamin A acts as a shield against diseases of the eyes, skin and heart, diarrhoea, and many other ailments. Carrots are very high in vitamin A, but Moringa leaves are even higher.

4 times the Calcium of Milk - Calcium builds strong bones and teeth, and helps prevent osteoporosis. Milk provides a lot of calcium, but Moringa leaves provide even more.

It's like growing multi-vitamins at your doorstep.





How do you use Moringa?

Moringa is easy to use:

- Add fresh or dried leaves to any dish, just like spinach
 - Dry the leaves in shade, powder them, and store in a dark container
 - 8 to 24 g of leaf powder daily improves health. Add to sauce or porridge a few minutes before the end of cooking
 - Eat the young pods like green beans
 - Make tea from the flowers
- Extract cooking oil from the seeds (Heat them, mash them and place in boiling water. Scoop the oil from the surface and use for cooking)
 - Feed the chopped stems to cattle, sheep or goats. They will get fatter more quickly
 - The roots are used to make powder, but the bark of the root is poisonous. It is dangerous to consume the roots too often or in large quantities
 - Moringa seeds can also be used to help make drinking water safe (See Action Sheet 23)

Where does Moringa grow?

Moringa is easy to grow:

- Can grow in poor soils
- Needs very little care or water
- Produces fruits & leaves within 8 months
- Plant away from homes, as it tends to attract undesirable caterpillars

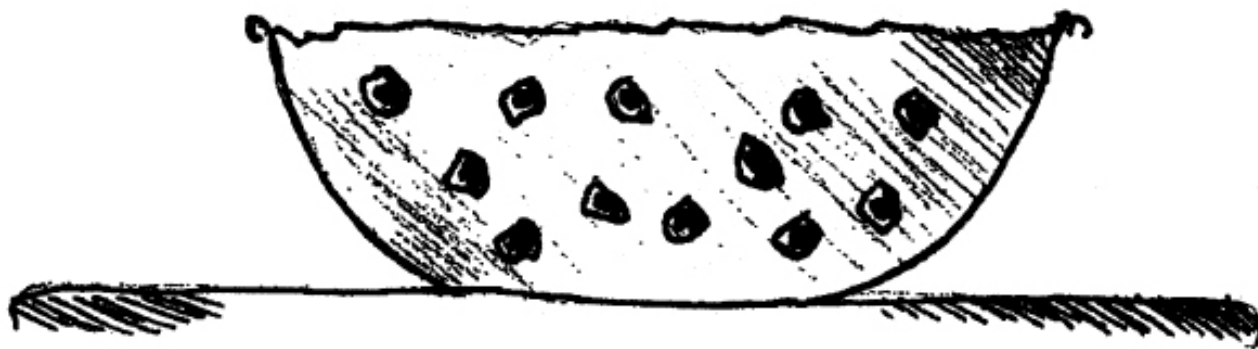
Moringa trees do best where temperature ranges from 26 to 40°C and annual rainfall is at least 500 mm. It grows well from sea level to 1000 m in elevation. It is resistant to most pests and diseases, although root rot can occur if the soil is too wet.

How do you grow Moringa?

After the trees have stopped producing fruits, branches need to be cut off so that fresh growth may take place. These branches are excellent for growing new trees. To grow Moringa from a cutting:

- Make a cutting at least 1" (2.5cm) in diameter and at least six feet (1.8m) long.
- Dig a hole 3 ft. (1m) x 3 ft. (1m) and 3 ft. (1m) deep.
- Place cutting in this hole and fill with a mixture of soil, sand and composted manure. Pack firmly around base of the cutting. Form a slight dome or cone shape, sloping down away from the cutting. It is desirable that water does not touch the stem of the new tree.
- Water generously, but do not drown the cutting in water.

You can also grow Moringa from seed, but this takes longer to give you a yielding tree. Researchers at the Kenya Forestry Research Institute found growth rates as high as seven metres in the first year from seed, with extremely high fruit yield. The main danger with seedlings is getting too much moisture before they become woody. Moringa seeds have no dormancy periods and can be planted as soon as they are mature.



**Soak the seeds in water
overnight, the day
before planting**

It is best to plant the seeds directly where the tree is intended to grow, and not to transplant the seedling. The young seedlings are fragile and often cannot survive transplanting. To plant seeds directly in the ground:

- Choose an area with light and sandy soil, not heavy with clay or water-logged.
- Dig holes 1 ft (30 cm) square and 1 ft deep. Back-fill the holes with loose soil. Compost or manure will help the tree grow better, even though Moringa trees can grow in poor soils.
- Plant 3 to 5 seeds in each hole, 2 in. (5 cm) apart. Plant the seeds no deeper than three times the width of the seed (approximately $\frac{3}{4}$ in. or 1.5 cm — the size of one's thumbnail).
- Keep the soil moist enough so that the top soil will not dry and choke the emerging saplings, but not too wet or else the seeds can drown and rot.
- When the saplings are four to six inches tall, keep the healthiest sapling in the ground and remove the rest. Termites and nematodes can kill a young sapling. Take measures to protect saplings from these two dangers.

Note: If the soil is heavy, dig a larger hole of up to 3 ft (90 cm) in diameter and 3 ft deep, and backfill with 1 part sand and 2 parts original soil. Added compost or manure will help.

In Plastic Bags

When it is not possible to plant directly in the ground, use the following method:

- Fill bags with light soil mixture, i.e. 3 parts soil to 1 part sand.
- Plant two or three seeds in each bag, $\frac{1}{4}$ in. (0.5 cm) deep.
- Keep moist but not too wet. Germination will occur within two weeks.
- Remove extra seedlings, leaving one in each bag.
- Seedlings can be transplanted after four to six months, when they are 2-3 ft (60-90 cm) high.

Transplanting

The ground where the trees are to be planted should be light and sandy, not heavy with clay or water-logged.

- Dig a hole 1 ft (30 cm) square and 1 ft deep. Backfill with loose soil. Adding compost or manure will help the trees grow better.
- Water the planting holes one day before transplanting the seedlings.
- Plant seedlings in the late afternoon to avoid the hot sun the first day.
- Make a hole in the pit to accept all soil in the bag. Carefully cut open the sack and place the seedling in the planting hole. Be careful to keep the soil around the seedling's roots intact.
- Pack soil around the seedling base.
- Water only lightly for the first few days.

If the seedlings fall over, tie them to a stick for support. Protect young saplings from termites and nematodes, and fence fields off from livestock.

Cultivation for leaf and pod harvest

FOR INTENSIVE MORINGA CULTURE

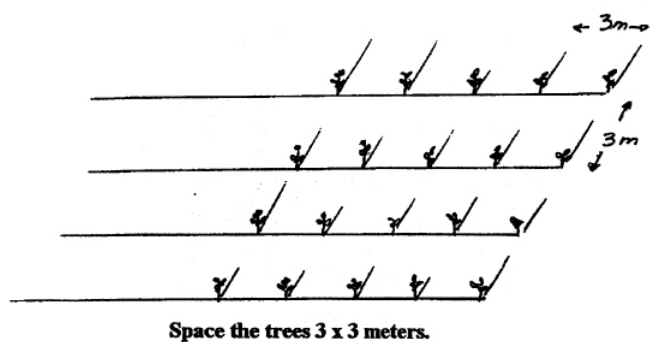
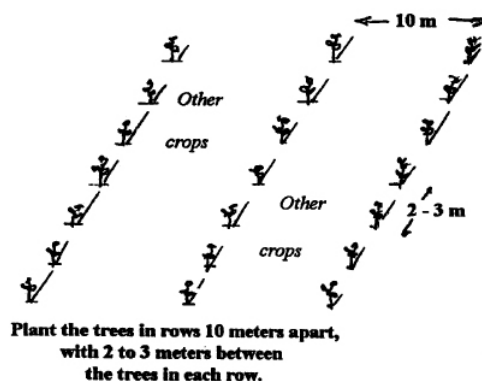


Image: Caroline Olivier

FOR ALLEY-CROPPING WITH OTHER CROPS



Trees grown for pods can be pruned to encourage them produce more branches, and remain low so that it is easy to harvest the pods. When the tree reaches a height of 60cm, prune by cutting the central growing stem 10cm from the top. About a month later, when the branches are about 20cm long, cut them by 10cm. After another month, cut the new branches again in the same way.

Cultivation for leaf harvest

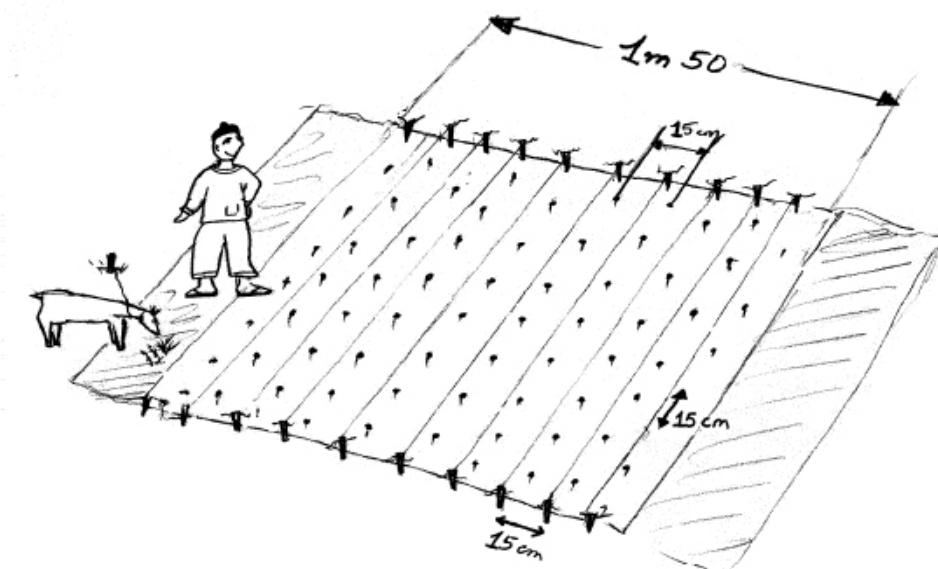


Image: Caroline Olivier

Water the seedlings once a day, or if this won't be possible, plant them at the beginning of the rainy season. When Moringa trees are grown close together like this, they can be harvested when they reach a height of 1m. Cut the top of the plant off, leaving a stump 30cm high. Bring the leaves to the house to make leaf powder and feed the stems, chopped up, to livestock. New shoots will grow from the stumps, allowing a second harvest in a few months time.

If the leaves of the tree start to go yellow, add manure or compost to the soil.

Where does Moringa come from?

The Moringa tree is originally from Northern India, but it now grows throughout the tropics? Here are just a few of the many names it goes by in Africa:

Country	Language	Name
Benin	Bariba	Yuru ara, Yorwata, Yoroguma
	Yoruba	Ewé ilé
Burkina Faso	Fulfuldé	Guilgandani, Gigandjah
	Moré	Alsam tiga/Arzam tigha ("the tree of paradise"), Argentiga, Alsan-tüga, argentina, arzantiga
Ghana	Dagari	Obnukuo, Ownwukuow, Zangala
Kenya	Swahili	Mkimbo, Mlonge, Mlongo, Mronge, Mrongo, Mzungu, Mzunze
Mali	Bambara	Névrédé
Senegal	Diola	Binêbeddai, Binêbeddaï
	Wolof	Nébédai, Nébèdaï, Nébédai, Neverday, Névoidai, Névoidaï, Nobodai, Nöbödaï, Sap-Sap
Zimbabwe	Tonga	Mupulanga, Zakalanda

FOR MORE INFORMATION:

Speak to local agroforestry experts about the best way to plant Moringa trees in your area. Healthcare professionals may have further information about using the leaves and pods to make healthy meals for young children.

CONTACTS

World Agroforestry Centre: www.worldagroforestry.org

Tree Africa: www.eafrica-utande.co.zw

Trees for Life: www.treesforlife.org

WEBSITES

Visit www.moringanews.org

Facts on Moringa: www.winrock.org/forestry/factpub/factsh/moringa.htm

ACKNOWLEDGEMENTS: This Action Sheet was prepared by Nancy Gladstone, based on the following sources: Moringa brochure by Trees for Life Moringa project, poster by TREE AFRICA and the World Agroforestry Centre, Farm Radio broadcast (Package 71, Script 4, July 2004) and several illustrated brochures written by Lowell J. Fuglie and illustrated by Caroline Olivier (available from www.moringanews.org)