

Moringa Oleifera

is deemed as a superfood because of its highly nutritious profile and medicinal properties. Given that it can grow in poor soil and requires little water, there is a massive opportunity in Pakistan to popularise it, not just as an all-natural rich source of nutrition for human consumption but for cattle and poultry feed as well.

MORINGA CAN BE USED AS



Food

Flower buds, tender pods and roots can be cooked in a gravy or pickled. The oil derived can also be used to cook in. Seeds from the plant that have yet to mature can be used as an alternative for green peas. The leaves can also be cooked down in a saag and can also be used to make tea.



A Crop Growth Enhancer

An extract from fresh leaves can be used as a plant growth enhancer as it is rich in zeatin (a cytokinin) and antioxidants (ascorbate, phenolics, carotenoids). It can also be used as a seed priming agent and foliar spray (2-3 sprays at critical stages) to increase the plant's tolerance to abiotic stresses and increases the yield of almost all crops (crops, vegetables, fruits, grasses etc) up to 35%.



Animal Fodder and Poultry Feed

Moringa is gaining popularity as a multi-cut fodder crop for fattening and increasing milk production. Unlike most fodder crops, Moringa can be grown on wide types of soils and can easily tolerate long dry spells up to even 6 months. Fresh leaves with tender stems can increase the weight of animals by up to 32% and milk production by 43-45%.



Extract Oil – Ben Oil:

Moringa seeds have an oil content of 25 to 45% more commonly known as ben oil. Similar to olive oil in its composition, it can be used for cooking, to treat burns and skin inflammation, massage, etc. It is a valuable commodity to be sold in international markets with an impressive shelf life.

MORINGA PRODUCTION TECHNOLOGY



Cultivation Methods: Moringa can be cultivated both through seeds and stem cuttings. Stem cutting is the most common method of propagation across Sindh and South Punjab. Trees propagated through stem cutting can bear fruit within one year and requires a 4 feet long mature stem cutting planted in a pit in such a way that a third of the stem is buried in soil. Cuttings planted in a nursery can be out-planted after 2 or 3 months.

For propagation through seed, dig a foot-length pit and add within a mixture of sand, silt and well-decomposed organic matter. Then sow two seeds in a hole and irrigate it. After a few weeks, seedlings will emerge. When seedlings reach a height of 6 inches, maintain one seedling per hill by thinning. This is used when growing moringa as crop for fodder or biomass production and it is cultivated though narrow spacing similar to the method being used cotton sowing.



Sowing Seasons: Spring (End of Feb to March) and Monsoon (July to August) are the best seasons to sow Moringa in Pakistan. However, barring winter, moringa can be grown round the year. The best time of stem cutting plantation is March and early April.



Intercropping: Moringa trees can be planted in gardens; the tree's root system does not compete with other crops for surface nutrients and the light shade provided by the tree will be beneficial to those vegetables which are less tolerant to direct sunlight. From the second year onward, Moringa can be inter-cropped with maize, sunflower and other field crops.



Pruning: Moringa should be trimmed to promote branching, increase yield, and facilitate harvesting. If left to grow without cutting the main trunk, the fast-growing tree will grow straight and tall producing leaves and pods only on the primary stem. To encourage the development of many branches and pods within easy reach from the ground, prune the apical growing shoot when the tree is 1.0–2.0 m high. Use a sharp cutting knife, machete, or pruning saw to make smooth cuts. New shoots will emerge from just below where the cut is made. Then, cut the growing tips of the branches so that the tree becomes bushier. Another pruning strategy is to cut back each branch by 30 cm when it reaches 60 cm in length. This will produce a multibranching shrub.



Watering: Moringa trees do not need much watering, which make them ideally suited for the climate of places where irrigation water is scarce. In very dry conditions, water regularly for the first two months and afterwards only when the tree shows visible signs of dryness. Moringa trees will flower and produce pods whenever there is sufficient water available.



Harvesting: When harvesting pods for human consumption, harvest when the pods are still young (about 1cm in diameter) and snap easily. Older pods develop a tough exterior, but the white seeds and flesh remain edible until the ripening process begins. When producing seed for planting or for oil extraction, allow the pods to dry and turn brown on the tree. In some cases, it may be necessary to prop up a branch that holds many pods to prevent it breaking off. Harvest the pods before they split open and seeds fall to the ground. Seeds can be stored in well-ventilated sacks in dry, shady places.

Flowers and pods are normally produced during the second year of growth. Harvest pods when they are young, tender, and green. They are eaten as green beans. unripe seeds can be used in recipes similar to green peas. Fresh or dried flowers are used for making tea. Leaves can be harvested after plants grow 1.5–2.0 m, which usually takes at least one year. Harvest leaves by snapping leaf stems from branches. Moringa leaves can easily lose moisture after harvesting, therefore, harvest early in the morning and sell the same day, if possible.

PRODUCTION PER ACRE

AS FODDER

	PLANT TO PLANT DISTANCE	ROW TO ROW DISTANCE	PLANTS PER ACRE
NORMAL CULTIVATION	02 FEET	2.5 FEET	8,712
INTENSIVE CULTIVATION	1 FOOT	2 FEET	21,780

AS NON-FODDER

PLANT TO PLANT DISTANCE	ROW TO ROW DISTANCE	PLANTS PER ACRE
10 FEET	6 FEET	726

VARIETY	SEED YIELD/TREE	SEED YIELD/ACRE	OIL RECOVERY%	OIL YIELD/ ACRE
Local /Pak	2 kg	1,452 kg	25%	363 L /acre

Sowing technique	Normal Cultivation	Intensive Cultivation
Number of Cuttings	6	6
Total Biomass Per Acre Per Year	40 tons/acre	100 tons/acre
Total Dry Matter	10.89 tons/acre	27.225 tons/acre

NUTRITIONAL VALUE

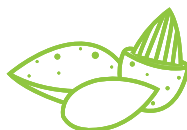
Moringa has a rich amount of vitamins mainly vitamin A and C, minerals (calcium, phosphorous, iron, copper, zinc, iodine, sulphur, selenium and manganese). It also contains eight essential amino acids and other powerful antioxidants. Moringa contains more than 90 nutrients and 46 different antioxidants which make it an excellent source of nutritive ingredients.



Fibre
15 times higher
than wheat



Vitamin A
11 times higher
than carrots



Vitamin B2
30 times higher
than almonds



Vitamin B1
5 times higher
than cowpea



Calcium
17 times higher
than milk



Potassium
18 times higher
than bananas



Vitamin C
4 times higher
than oranges



Protein
2 times higher
than eggs



Iron
26 times higher
than spinach

HEALTH BENEFITS OF MORINGA

- Nutrient-packed ●
- Fights free radicals ●
- Fights inflammation ●
- Helps reduce some diabetes symptoms ●
- Protects the cardiovascular system ●
- Supports brain health ●
- Protects the liver ●
- Enhances wound healing ●



The following was prepared by Rural Support Programmes Network (RSPN) with technical support from Action Against Hunger (ACF) for Programme for Improved Nutrition in Sindh (PINS) which is being implemented in support of the Accelerated Action Plan, Government of Sindh. PINS is funded by the European Union.



This publication was produced with the financial support of the European Union. Its contents are the sole responsibility of Rural Support Programmes Network (RSPN) and do not necessarily reflect the views of the European Union

More information about European Union is available on:
 Web: <http://eeas.europa.eu/delegations/pakistan/>
 Twitter: @EUPakistan
 Facebook: European-Union-in-Pakistan

CONSEIL SANTÉ



Find out more about Programme for Improved Nutrition in Sindh on:
 www.rspn.org
 www.facebook.com/RSPNPakistan
 www.facebook.com/ProgrammeforImprovedNutritioninSindh
 www.aap.gos.pk