"Approximately 1/2 of the earth's land surface is used for agriculture. Of all grazing land in the U.S., more than 1/2 is now overgrazed and subject to high erosion rates."

"A mere 2 percent increase in the carbon content of the planet’s soils could offset 100 percent of all greenhouse gas emissions going into the atmosphere."

—DR. RATTAN LAL, OHIO STATE SOIL SCIENTIST
“The hardest thing to see is what is in front of your eyes.”
- Goethe
These leaves could save millions of lives.
The Moringa Tree

*Moringa oleifera*
It is said that the Moringa tree originated in Northern India. Records show Moringa being used in Indian medicine some 5,000 years ago.
Varieties

Thirteen Moringa species are known:

M. oleifera
M. arborea
M. borziana
M. concanensis
M. drouhardii
M. hildebrandtii
M. longituba
M. ovalifolia
M. peregrina
M. pygmaea
M. rivae
M. ruspoliana
M. stenopetala
In ancient times, Moringa was known and used in traditional societies around the world. This was long before people had the tools of instant communication that we have today.
Ancient World Knowledge

Nutrition
Disease Prevention
Ointment
Alley Cropping
Fertilizer
Erosion Control
Water Purification
Cosmetics
Textile Printing
Insecticide
Fungicide
Lubricants
Tanning Leather
Dye
Fiber Products
Fences
Ornamentation & Shade
Wind Barrier
Cane Juice Clarifier
Honey Production
Condiment
Cooking Oil
Honey Clarifier
Food

Traditional medicine:
Anemia
Anxiety
Asthma
Blackheads
Blood impurities
Blood pressure
Bronchitis
Catarrh
Chest congestion
Cholera
Colitis
Conjunctivitis
Cough
Diabetes
Diarrhea
Dropsy
Dysentery
Eye and ear infections
Fever
Glandular swelling
Gonorrhea
Headaches
Hysteria

Intestinal worms
Jaundice
Lactation
Malaria
Pain in joints
Pimples
Pregnancy
Psoriasis
Respiratory disorders
Scurvy
Semen deficiency
Skin infections
Sore throat
Sores
Sprain
Stomach ulcers
Tuberculosis
Tumor
Urinary disorders
Wounds

Sources: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
The oil from the *Moringa Oleifera* nut was used by the ancient Egyptians. This extremely fast growing woody species (*Moringa oleifera*, *Moringaceae*) could open up a new category of crops: vegetable trees.
Today, scientists are beginning to investigate the traditional claims about Moringa. Let’s take a look at what they have found.
One aspect that scientists have examined is the nutritional value of Moringa leaves.
Tiny leaves.

Enormous Benefits.

Gram-for-gram comparison of nutritional data:

- 7 times the Vitamin C of Oranges
- 4 times the Vitamin A of Carrots
- 4 times the Calcium of Milk
- 3 times the Potassium of Bananas
- 2 times the Protein of Yogurt
It’s like growing multi-vitamins at your doorstep.
Rare for a plant source, Moringa leaves contain all the essential amino acids... 

...to build strong, healthy bodies.
Moringa even contains arginine and histidine—two amino acids especially important for infants.

Experts tell us that 30% of children in sub-Saharan Africa are protein deficient. Moringa could be an extremely valuable food source.
Fresh leaves and common foods

**Vitamin A**
- Carrots: 1.8 mg
- Fresh Leaves: 6.8 mg
- Dried Leaves: 18.9 mg

**Vitamin C**
- Oranges: 30 mg
- Fresh Leaves: 220 mg
- Dried Leaves: 17.3 mg

**Calcium**
- Milk: 120 mg
- Fresh Leaves: 440 mg
- Dried Leaves: 2003 mg

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Fresh leaves and common foods¹, Dried leaves²
Fresh leaves and common foods

Note: Iron from plants, including spinach and Moringa, is generally difficult for the body to absorb.

Iron

- Spinach: 1.14 mg
- Fresh Leaves: 0.85 mg
- Dried Leaves: 28.2 mg

Potassium

- Banana: 88 mg
- Fresh Leaves: 259 mg
- Dried Leaves: 1324 mg

Protein

- Yogurt: 3.1 g
- Fresh Leaves: 6.7 g
- Dried Leaves: 27.1 g

Fresh leaves and common foods, Dried leaves
Common Names for Moringa
(See more at: treesforlife.org/moringa/names)

While native to the Indian sub-continent, Moringa has spread throughout the tropical and sub-tropical regions of the world. Here are some of the many common names for Moringa.

**English:** Drumstick tree, (Horse)radish tree, Mother’s best friend, West Indian ben

**Spanish:** Ben, Árbol del ben, Morango, Moringa

**French:** Bèn ailé, Benzolive, Moringa

**Africa**
- Benin: Patima, Ewé ilé
- Burkina Faso: Argentiga
- Cameroon: Paizlava, Djihiré
- Chad: Kag n’dongue
- Ethiopia: Aleko, Haleko
- Ghana: Yevu-ti, Zingerindende
- Kenya: Mronge
- Malawi: Cham’mwanba
- Mali: Névrédé
- Niger: Zógla gandi
- Nigeria: Ewe ile, Bagaruwar maka
- Senegal: Neverday, Sap-Sap
- Somalia: Dangap
- Sudan: Ruwag
- Tanzania: Mlonge
- Togo: Baganlua, Yovovoti
- Zimbabwe: Mupulanga

**Asia**
- Bangladesh: Sajina
- Burma: Dandalonbin
- Cambodia: Ben ailé
- India: Sahjan, Murunga, Moonga
- Indonesia: Kalor
- Pakistan: Suhanjna
- Philippines: Mulangai
- Sri Lanka: Murunga
- Taiwan: La Mu
- Thailand: Marum
- Vietnam: Chùm Ngây

**South and Central America, Caribbean**
- Brazil: Cedro
- Colombia: Angela
- Costa Rica: Marango
- Cuba: Palo Jeringa
- Dominican Republic: Palo de aceiti
- El Salvador: Teberinto
- French Guiana: Saijhan
- Guadeloupe: Moloko
- Guatemala: Perlas
- Haiti: Benzolive
- Honduras: Maranga calalu
- Nicaragua: Marango
- Panama: Jacinto
- Puerto Rico: Resada
- Suriname: Kelor
- Trinidad: Saijan
Consider the Possibilities

Sources: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Moringa’s Potential
• Human Health
• Livestock Fodder
• Plant Growth Enhancer
• Biogas
Human Health

One of the main uses of Moringa leaves is for their nutritional benefits in human health.
Test in Senegal

Conducted by:

• Mr. Lowell Fuglie, Church World Service in Dakar

• AGADA (Alternative Action for African Development)
Test in Senegal

Results:

• **Children** maintained or increased weight and improved health.

• **Pregnant women** recovered from anemia and had babies with higher birth weights.

Source: 2
Research in Nicaragua

Some of the most ground-breaking research on new uses of Moringa has taken place in Nicaragua.
Mr. Nikolaus Foidl and his associate, Leonardo Mayorga, have been researching agricultural uses of Moringa in Nicaragua since the early 1990s. They have collaborated with the University of Hohenheim, Germany and with Dr. Michael Kreuzer of the Swiss Federal Institute of Technology in Zurich.
Dr. Nadir Reyes Sánchez is a scientist on the faculty of the Department of Animal Nutrition and Management at the Swedish University of Agriculture Sciences in Uppsala, Sweden. He is also on the faculty of Animal Sciences at the National University of Agriculture in Managua, Nicaragua.

Dr. Reyes has also been conducting Moringa research in Nicaragua, and is shown here on his Moringa plantation.
Intensive Cultivation

Some people may wonder how a tree can supply nutrition for a large number of people. Both Foidl and Reyes have experimented with growing Moringa intensively, as a field crop.
Normally, Moringa grows in the typical form of a tree, like this...
or like this . . .
But Foldl. and Reyes have shown that Moringa trees can also be planted very close together as a field crop, at a spacing as close as ten to fifteen centimeters.
The moringa plants then grow as a field crop, and can be harvested frequently. This technique produces a large amount of usable green matter from a relatively small amount of space.

Dr. Reyes has grown Moringa intensively with no irrigation and small amounts of fertilizer. He was able to harvest the leaves every 75 days—four crops in a year. He got a total of 100 tons of green matter per hectare the first year, and 57 tons per hectare the second year.

Mr. Foidl irrigated his Moringa plantation and used larger amounts of fertilizer. He reported harvesting every 35 days—nine crops per year—with a total yield of 650 to 700 tons of green matter per hectare. He says this yield has been consistent from the same plants for seven years.
Using this technique of intensive cultivation, plots of Moringa are planted on a rotation schedule, so that there is an ongoing supply of green matter. The plants are harvested 8 to 10 inches above the base, and all of the leaves and green shoots can be used. The green tops grow back in 35 to 75 days, and are ready to be harvested again.
Livestock Fodder

Both Foidl and Reyes have also experimented with using Moringa leaves and green shoots as a supplement in livestock fodder.
Increases daily weight gain up to 32%

Increases milk production 43% to 65%

Mr. Foidl found that adding Moringa leaves to cattle feed increased their daily weight gain by up to 32 percent. [Advance forward]

Both Foidl and Reyes also experimented with Moringa and milk cows. Foidl supplemented with 15 to 17 kilograms of fresh Moringa leaves daily, and the cattle’s milk production increased by 43 percent.

Reyes supplemented his milk cows’ feed with 2 kg dry matter of Moringa per day, and milk production increased by 58 percent. Then he supplemented with 3 kg dry matter per day, and milk production increased by 65 percent.

Imagine what would be possible if milk production in developing countries could be increased in this way. It could prevent untold suffering of people with protein deficiency.
Mr. Foidl has also experimented with a plant growth spray made from the green matter of Moringa.
Plant Growth Spray

• Extract juice from green matter

• Dilute with 36 parts water

• Spray 25ml on each plant

The process of making the Moringa plant growth spray is relatively simple, and can be done with whatever equipment is available for extracting juice from the green matter and applying the spray to plants.
Here the spray is being applied to sugarcane. Foidl has also found the spray to be effective with soybeans, corn, turnips, black beans, red beans, white beans, cow peas, bell peppers, *chia*, sunflowers, mung beans, onions, coffee, tea, chili peppers, melons and sorghum.
Foidl is now experimenting with this plant growth spray on large 25-hectare plots of vegetable crops.
The spray can be applied to individual plants on a small scale, or, where equipment is available, it can be done on a very large scale.
Effects of Spray

- Accelerates growth of young plants
- Plants are firmer, more resistant to pests and disease
- Longer life-span
- Heavier roots, stems and leaves
- Produce more fruit
- Larger fruit
- Increase in yield 20-35%

Foidl has found that this spray has a wide range of beneficial effects on plant crops. If even a fraction of these results could be reproduced in the field, it could be a great help in increasing food supplies for millions of hungry people.
Bell Pepper

Spray

Control
The spray even stimulates the growth of the plant’s roots. Here we see a comparison of roots from sugarcane plants that received the spray with roots from the plants in the control group, which did not receive the spray.
Turnips

Freeze Dried Spray  Control  Spray
Foidl and his associates have also experimented with producing biogas (methane) from Moringa green matter.
Based on his experiments, Foidl estimates that more than 4,400 cubic meters of methane could be produced per hectare of Moringa per year. That is up to twice as much methane as can be produced per hectare per year from sugar beet leaves, a common plant material for biogas. Further experiments are needed to examine this potential use of Moringa.
Need for Studies

- Human Health
- Livestock Fodder
- Plant Growth Enhancer
- Biogas

These and other uses of Moringa leaves show great potential for benefitting people—especially those who suffer from poverty and malnutrition. Further scientific studies are needed to examine these uses and their benefits, and to determine the techniques that will produce the greatest benefits.
How to Help

• Share this information with key decision-makers in your country.

• Promote field studies and clinical studies in your country.

• Share your findings with the rest of the world.
& Plant More Trees!

Moringa Trees

PLANTING THE TREE

4. Dig the planting hole 60 cm deep

2. Mix some manure with the soil
   water the hole the evening before planting or wait for a good rainfall.

5. PLANTING A SEEDLING OR DIRECT SEEDING

Plant the seeds 1 cm deep
Trees for Life Journal
Share your findings with the world at:
www.TFLJournal.org
Consider the Possibilities

It’s time that we seriously consider the possibilities of Moringa. The simple act of sharing this information with others could help save millions of lives.
References


THE MIRACLE of MORINGA!

THE ZIJA OPPORTUNITY
It's Your Time

“Everyone is looking for better health along with more financial and time freedom; with Zija, you can have it all”
— Zija Mission Statement
Contact Us

Web: NaturallyHealthyMoringa.info
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Thankyou!