
“The hardest thing to see is what is in front of your eyes.”
- Goethe

These leaves could
save millions of lives.

These tiny little leaves have the potential to save the lives of millions of people on our planet. What kind of leaves are they?

The Moringa Tree
Moringa oleifera

They are the leaves of the humble Moringa tree. The scientific name for this tree is 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

As Moringa spread from India to other tropical and subtropical areas, it adapted to local conditions. Over time, these thirteen distinct species of Moringa developed.

Moringa Knowledge in the Ancient World

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. So people must have discovered Moringa independently in all of these places, and they all found great value in it. This fact alone suggests that Moringa is worth investigating.

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

People in these societies discovered a vast array of uses for Moringa. This knowledge existed in many different parts of the world—Africa, Latin America, South America, India, Indonesia, and many island nations.

Scientific Knowledge

Today, scientists are beginning to investigate the traditional claims about Moringa. Let’s take a look at what they have found.

Nutritional Value

One aspect that scientists have examined is the nutritional value of Moringa leaves.

Tiny leaves.

Enormous benefits.

=

7 times the Vitamin C of Oranges

4 times the Vitamin A of Carrots

4 times the Calcium of Milk

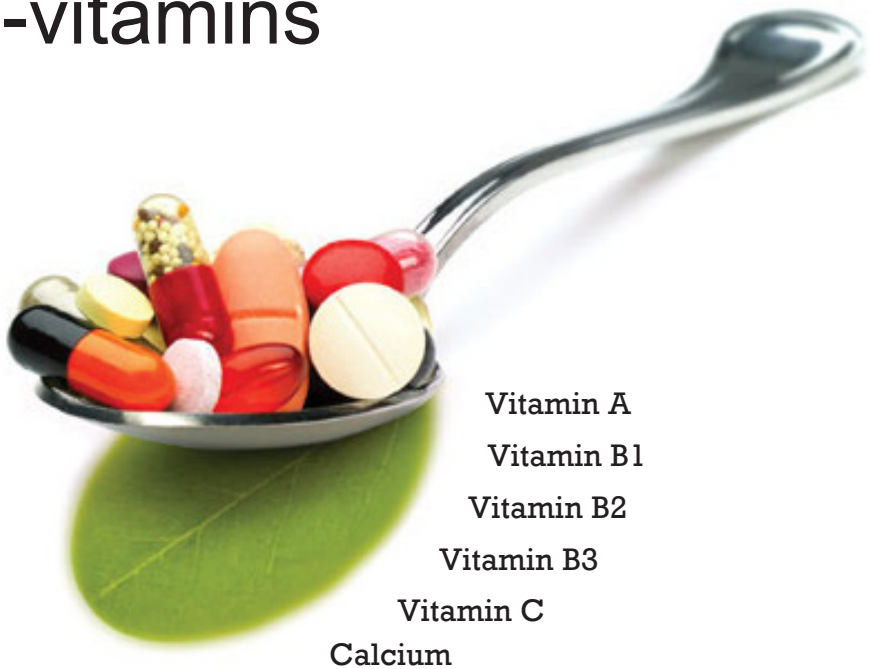
3 times the Potassium of Bananas

2 times the Protein of Yogurt

Gram-for-gram comparison of nutritional data[1]

Nutritional analysis has shown that Moringa leaves are extremely nutritious. In fact, they contain larger amounts of several important nutrients than the common foods often associated with these nutrients. These include vitamin C, which fights a host of illnesses including colds and flu; vitamin A, which acts as a shield against eye disease, skin disease, heart ailments, diarrhea, and many other diseases; Calcium, which builds strong bones and teeth and helps prevent osteoporosis; Potassium, which is essential for the functioning of the brain and nerves, and Proteins, the basic building blocks of all our body cells.

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

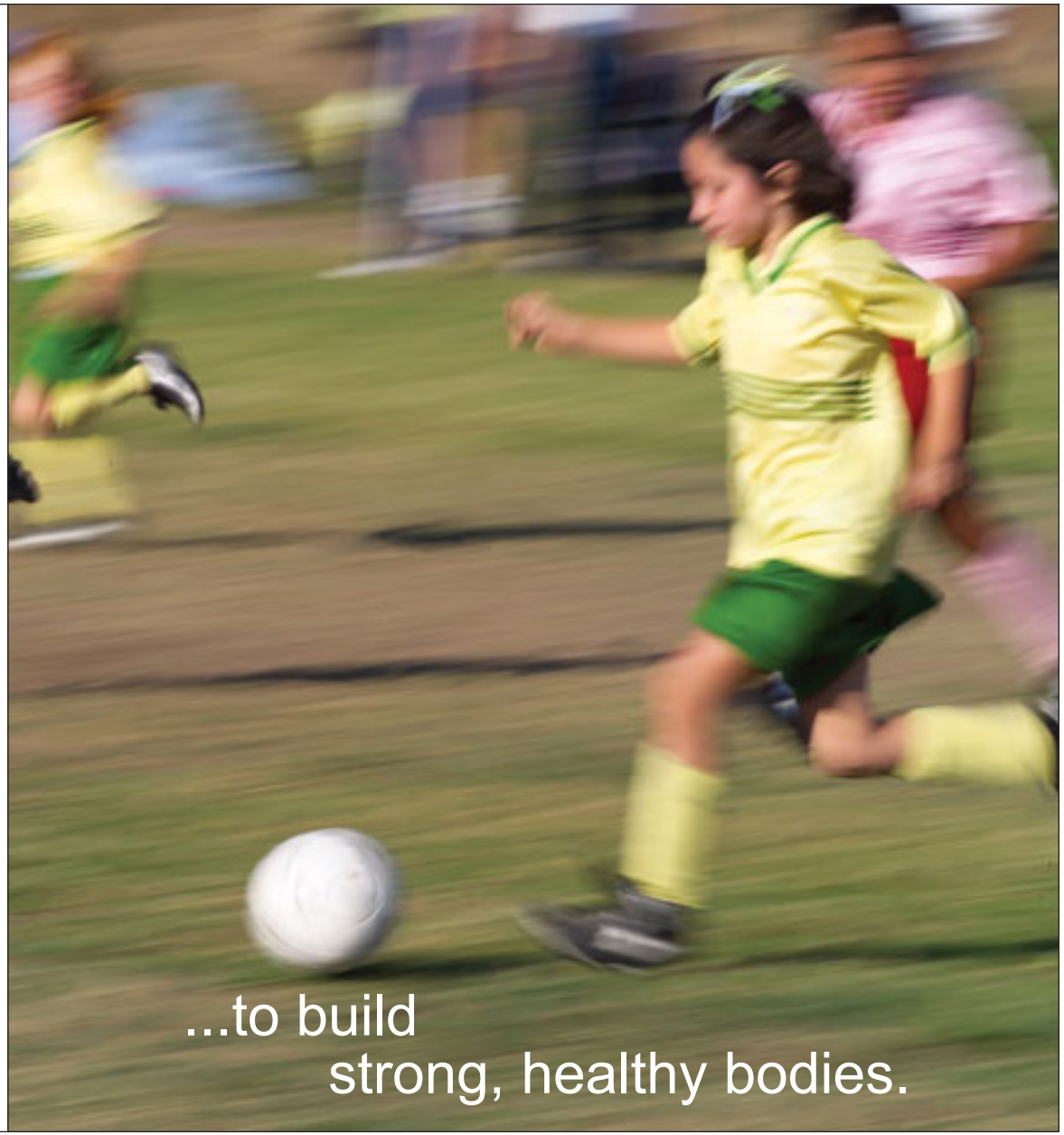


Vitamin A
Vitamin B1
Vitamin B2
Vitamin B3
Vitamin C
Calcium
Chromium
Copper
Iron
Magnesium
Manganese
Phosphorus
Potassium
Protein
Zinc

Not only that, but Moringa leaves also contain a wealth of other complementary vitamins and minerals.

Rare for a
plant source,

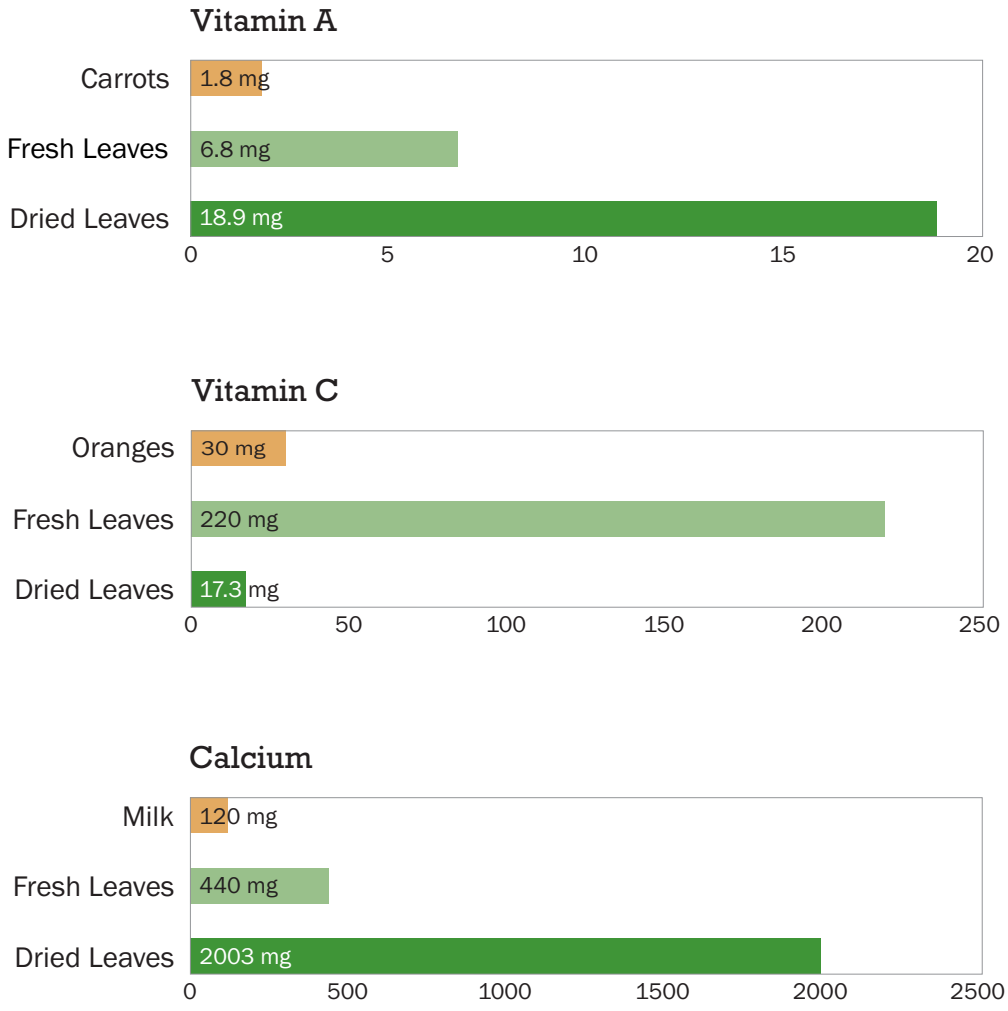
Moringa leaves
contain all
the essential
amino acids…



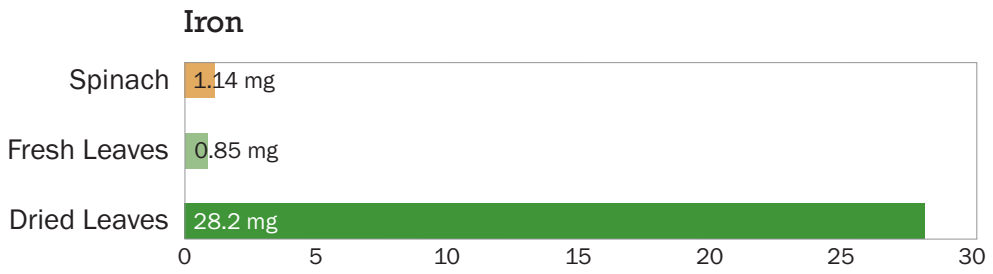
Another important point is that Moringa leaves contain all of the essential amino acids, which are the building blocks of proteins. It is very rare for a vegetable to contain all of these amino acids. And Moringa contains these amino acids in a good proportion, so that they are very useful to our bodies. These leaves could be a great boon to people who do not get protein from meat.

Moringa even contains argenine and histidine—two amino acids especially important for infants.

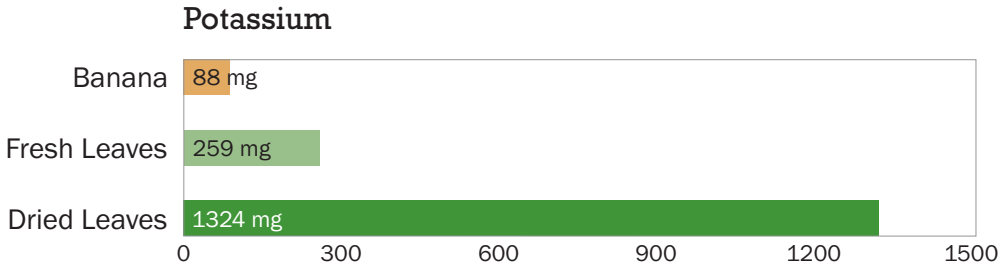
It is noteworthy that Moringa contains argenine and histidine, which are especially important for infants who are unable to make enough protein for their growth requirements. Experts tell us that 30% of children in sub-Saharan Africa are protein deficient. Moringa could be an extremely valuable food source.

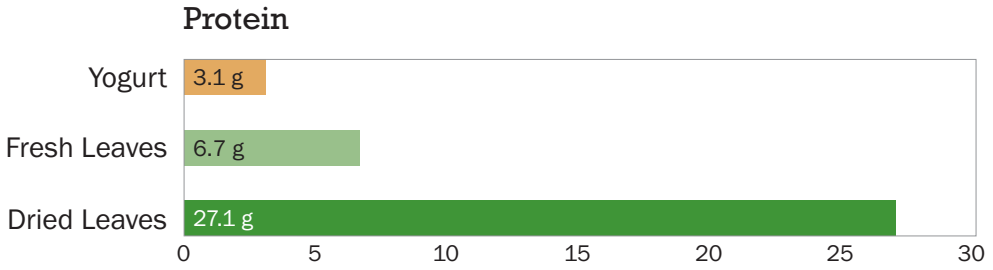


These graphs show the content of vitamin A, vitamin C and calcium in fresh Moringa leaves and dried leaves, compared to common foods. Except for vitamin C, very little nutritional value is lost in the drying process. This is important because dried leaves can be stored for use much longer than fresh leaves, so that a supply is available year-round.



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





Fresh leaves and common foods[1], Dried leaves[2]

Here are the comparisons for iron, potassium, and protein in fresh Moringa leaves and dried leaves. Once again, we see how drying the leaves condenses the nutrients, so that a large dose of nutrition can be gained from a small spoonful of dried leaf powder.

Common Names for Moringa

(See more at: treesforlife.org/moringa/names)

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: Zôgla 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

Oceania
Fiji: Sajina
Guam: Katdes
Palau: Malungkai

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.

Malnutrition

Moringa

Malnutrition map[13]

We are all well familiar with the problems of malnutrition in our world, and how much suffering and death result. Here are the countries with the highest rates of malnutrition. The amazing thing about Moringa is that . . . it grows in almost exactly the same places. These are the countries where Moringa grows—exactly where it is needed the most.

Leaves:
Nutrition
Medicine

Trees:
Alley Cropping
Erosion Control

Flowers:
Medicine

Pods:
Nutrition
Medicine

Consider the Possibilities

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 & Clarifier • Condiment • Cooking Oil • 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

Roots:
Medicine

Seeds:
Water Purification
Medicine
Oil

Gum:
Medicine

Bark:
Medicine

Sources: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

Not only are the leaves highly nutritious, but every single part of the Moringa tree has been used for beneficial purposes. Here again is the list of all the many specific uses people have found for Moringa. [When the words “Consider the Possibilites” appear:] It’s time that we seriously consider the possibilities that Moringa holds for benefiting our world.

Moringa's Potential

Moringa holds tremendous potential for serving the world in several ways . . .

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

They include: improvement of Human Health; use as a Livestock Fodder supplement; use as a Plant Growth Enhancer; and for production of 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)

In 1997 to 1998, a test was conducted in Senegal to examine the ability of Moringa leaf powder to prevent or cure malnutrition in pregnant or breast-feeding women and their children. This test was a collaboration between Church World Service, whose Senegal representative was well-known Moringa expert Mr. Lowell Fuglie, and the Senegalese organization Alternative Action for African Development (AGADA).

Test in Senegal

Results:

Children maintained or increased weight and improved health.

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

This test found the following effects to be common among subjects taking Moringa leaf powder: Children maintained or increased their weight and improved overall health, and pregnant women recovered from anemia and had babies with higher birth weights. This test is now being duplicated and expanded in Ghana. Further tests are needed in other countries as well.

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 Sanchez 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 . . .

. . . or like this.

But Foidl 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. 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.

Plant Growth Enhancer

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 experimening with this plant growth spray on large 25-hectare plots of vegetable crops.

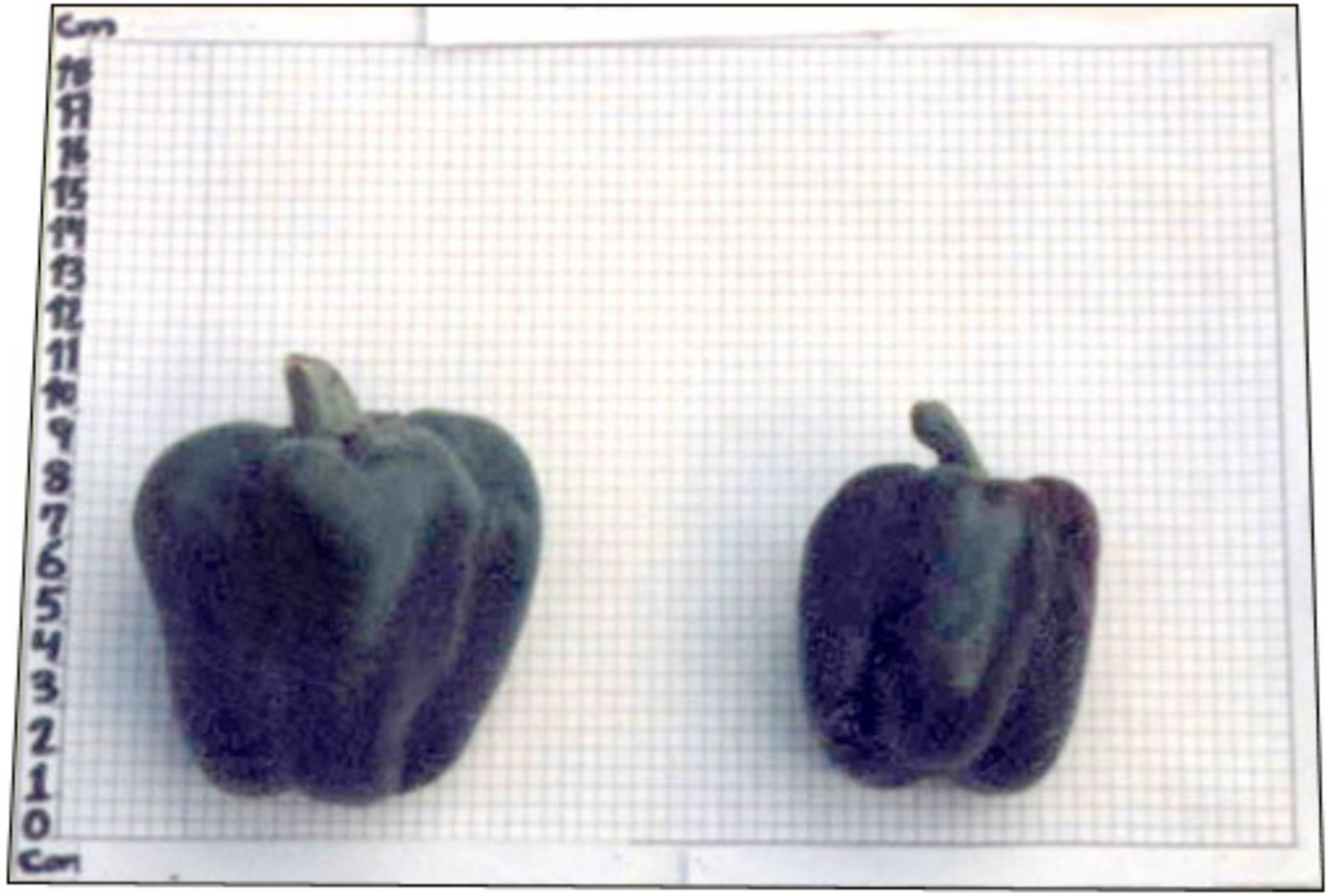
The spray can be applied to individual plants on a small scale, or, where equipment is available, it can be done on a very large scale.

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

Here you can see the effects of the Moringa plant growth spray on bell peppers. These are average sizes of peppers grown with spray applied, and in the control group that did not get sprayed.

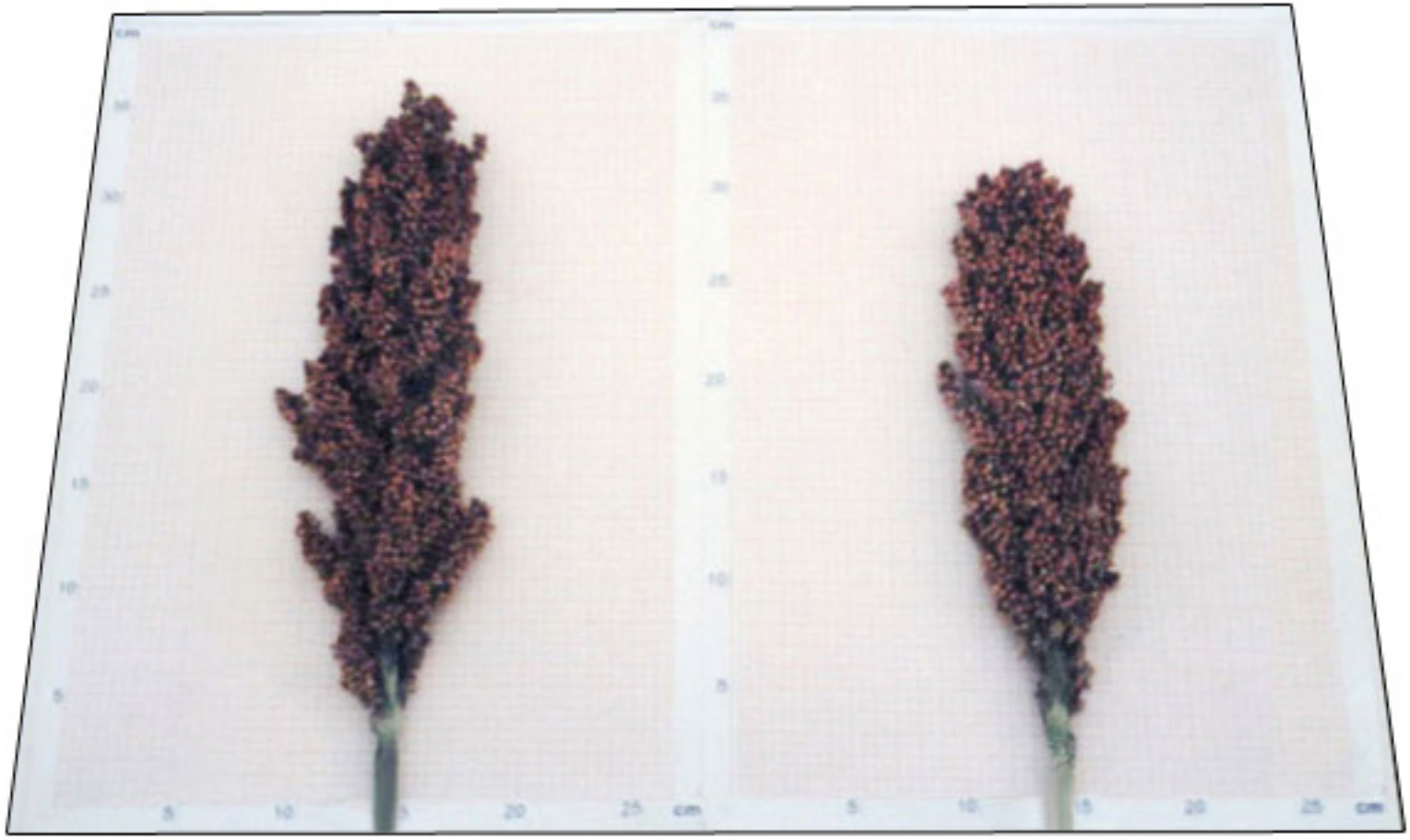
Sugar Cane Roots

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.

Sorghum



Spray Control

Here is the difference in average sizes of seed heads from sorghum plants grown with spray applied, and from the control group that did not receive spray.

Turnips

Freeze Dried Spray | Control | Spray

The plant growth spray can be freeze-dried and stored for later use. Here are some typical sizes of turnips grown with freeze-dried spray, from the control group without spray, and with fresh spray. The freeze-dried spray also increases the size of the turnips, only slightly less than the fresh spray.

Biogas

Foidl and his associates have also experimented with producing biogas 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 benefiting 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. We would suggest studies in these four areas: human nutrition and medicinal uses, livestock fodder, crop enhancement with the plant growth spray, and production of biogas. The information just presented comes from the research of only a few scientists. Now these tests need to be replicated by many more people around the world.

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.

People can help this process in three ways: 1) Share this information with key decision-makers in your country. 2) Promote field studies and clinical studies in your country. And 3) Share your findings with the rest of the world.

Trees for Life Journal

Share your findings with the world at: www.TFLJournal.org

Trees for Life can help share the findings of Moringa research to benefit the world through our online forum, the Trees for Life Journal. Simply submit your findings through the journal website at: www.TFLJournal.org

Consider the Possibilities

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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.

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