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Moringa for Cattle Fodder and Plant Growth

Two recent studies in Nicaragua determined that:

1. Adding *Moringa oleifera* leaves and green stems to fodder increased cattle's daily weight gain up to 32% and increased their milk production 43-65%.

2. A plant-growth spray made from *Moringa oleifera* leaves increased crop production 20-35%.

Even if a fraction of these results could be reproduced in the field, it would be a great boon to people in developing countries. This possibility needs to be investigated further and various aspects examined before the concept can be popularized. Trees for Life would like to help promote and foster such research.

Background information on this subject follows.

Moringa

Moringa (*Moringa oleifera*) is native to the Indian subcontinent, and has become naturalized in tropical and subtropical areas around the world. People use its flowers and long pods as vegetables. Every part of the tree, from the bark to the leaves to the roots, is used in traditional medicine. However, most people are not aware of the great variety of potential benefits of the leaves.

Recent studies indicate that these leaves have immense nutritional value. They are loaded with vitamins, minerals and all of the essential amino acids. For additional information, see www.treesforlife.org/moringa and our Moringa Book at www.treesforlife.org/moringa/book.

Research in Nicaragua

Nikolaus Foidl and Dr. Gabrielle Foidl, two Austrian scientists living in Nicaragua, have developed intensive methods of cultivating Moringa. They, along with their associate Leonardo Mayorga, have been conducting their research in Nicaragua since the early 1990s. They have collaborated with the University of Hohenheim, Germany and with Dr. Michael Kreuzer, ETH (Swiss Federal Institute of Technology) Zurich, Switzerland.

With Nikolaus Foidl (center) and Leonardo Mayorga (right) in Nicaragua

Their intensive cultivation methods were developed under experimental conditions on plots ranging in size from 0.5 to 4 hectares. Foidl and his associates have experimented with various uses of Moringa leaves and green stems, including their use in cattle fodder.

Moringa seeds can be planted 10 cm apart.

The green matter can be harvested every 35 days.

Following the Foidl study, a study was conducted by Dr. Nadir Reyes Sanchez. Dr. Reyes is on the Faculty of the Veterinary Medicine and Animal Science Department of Animal Nutrition and Management at the Swedish University of Agricultural Sciences in Uppsala, Sweden.

Dr. Sanchez (left) on his Moringa farm

Cattle Fodder Supplement

These two studies in Nicaragua showed that supplementing cattle feed with the leaves and green stems of Moringa can increase milk production by 43-65%, and increase daily weight gain in cattle by up to 32%.

These studies also demonstrated that **Moringa can be grown instensively as a field crop**:

- One single planting lasts for several years.
- Foidl, et al. have been able to harvest it up to 9 times a year from irrigated and well-fertilized land, producing per year:
- 650 to 700 metric tons of green mass
- Equivalent to 100 to 110 metric tons of dry mass
- 17.5 metric tons of pure protein
- 7000 kg of lipids, with 65% being omega-3 fatty acids
- 10 metric tons of fermentable sugars
- Approximately 8 metric tons of starch
- Approximately 45 metric tons of hemicellulose and cellulose.

Dr. Sanchez's study was done without irrigation and with much less fertilizer, and resulted in a total of 100 tons of green mass harvested from four crops in a year. However, milk production and cattle weight increased substantially in both studies.

All these factors may make Moringa leaves and green stems very attractive and inexpensive as a cattle fodder supplement. To our knowledge, additional studies are already in progress in Bolivia, Columbia, Brazil and Ghana.

Plant growth spray

Formula:

Extract juice from green matter

Dilute with 36 parts water

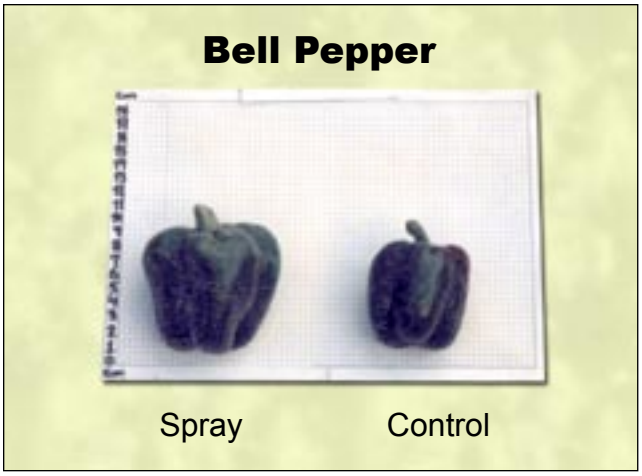
Spray 25ml on each plant

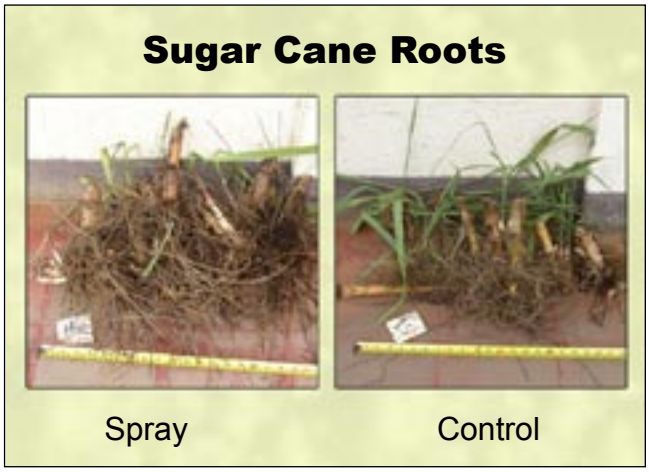
Recently a new benefit of Moringa was suggested: the leaves seem to contain a substance that stimulates plant growth and increases crop production. Several years ago, Mr. Nikolaus Foidl came across a reference to a study by a Mr. Singh of India. It said that an extract from Moringa leaves seemed to stimulate the growth of plants.

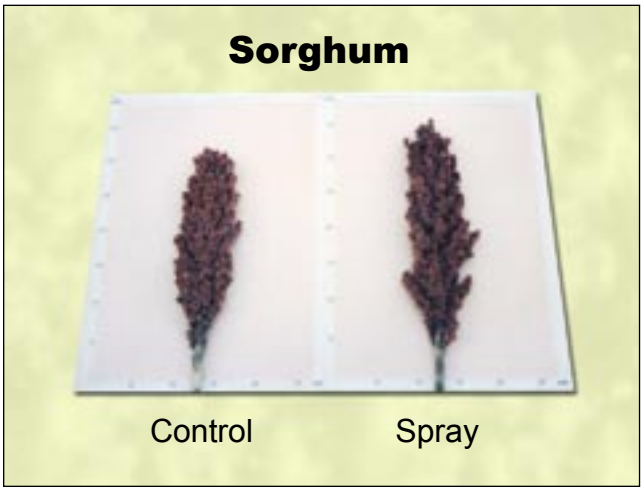
Mr. Foidl and his colleagues tested the process with various crops and refined the protocol. They have successfully applied the formula to large-scale farming.

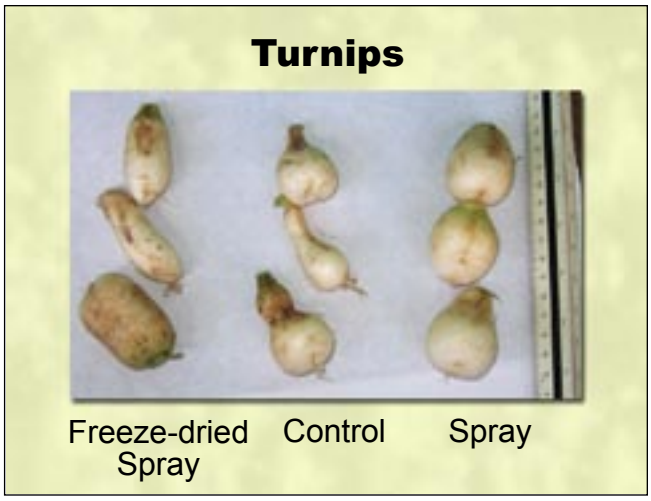
Foidl, et al. found that the spray produced the following effects on crops:

- 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%









For large-scale farming, Moringa spray was freeze-dried for use at appropriate times.

Subjects for Research

The following research studies could be of immediate use to people in developing countries:

- Agronomy of intensive planting and harvesting of Moringa leaves and green stems, in both dry and irrigated parts of the country
- Impact on cattle's weight gain and milk production
- Analysis of milk produced
- Affect of spray on various crops

About Trees for Life

Trees for Life is an international nonprofit movement that demonstrates that in helping each other, people can unleash extraordinary power that enriches our lives. Our mission is to create hope through a movement in which people join hands to break the cycle of poverty and hunger and care for our earth.

If any research institution in your country is interested in investigating the potential of Moringa leaves to improve food production, then Trees for Life could be of service in the following ways:

- Connecting scientists with existing information on this subject (see attached list of articles)
- Connections with other research institutions

Let us know if we can be of further service.

With regards,

Balbir Mathur

Agricultural uses of Moringa leaves could help increase the production of milk, meat and vegetable crops. Trees for Life would be glad to help with research in these areas.

Further information/resources:

(Note: Summaries of the following articles are available in the Moringa Gateway at: www.tfljournal.org/gateway.php)

1. Fuglie, Lowell. 2000. New uses of Moringa studied in Nicaragua. ECHO's Tropical Agriculture Site. Available at: http://www.echotech.org/network/modules.php?name=News&file=article&sid=194

2. Foidl, N., Makkar, H.P.S. and Becker, K., 2001. The potential of Moringa oleifera for agricultural and industrial uses, pp 45-76, In: The Miracle Tree: The Multiple Attributes of Moringa (Ed) Lowell J. Fuglie, CTA, Wageningen, The Netherlands. http://www.moringanews.org/actes/foidl_en.doc

The following documents are available online:

Moringa oleifera and Cratylia argentea: Potential fodder species for Ruminants in Nicaragua (en anglais, PDF 321 Ko) http://www.moringanews.org/documents/Reyesthesis.pdf

Effects of feeding different levels of foliage from Moringa oleifera to creole dairy cows on intake, digestibility, milk production and composition (en anglais, PDF, 127 Ko)
http://www.moringanews.org/documents/LivestProd.pdf

Moringa fodder in ruminant nutrition in The Gambia: http://www.moringanews.org/documents/Fodder.doc

The following articles may also be of interest:

Comparative studies on nutritive values of tender foliage of seedlings and mature plants of Moringa oleifera Lam.
D'Souza, J. Kulkarni, A. R.
Department of Life Science, University of Bombay, Santacruz East, Bombay 400098, India.
J.Econ.Tax.Bot., 17 (2) pp479-485. (Journal article, isbn: 0250-9768)

Propagation techniques of Moringa oleifera Lam.. Enriched title: Propagation techniques of Moringa oleifera Lam. [fodder trees, India]
Sharma, G.K. Raina, V. 1980
Improvement of forest biomass : symposium proceedings / edited by P.K. Khosla. (ABBREV TITLE = Improv For Biomass) p. 175-181. Proceedings of a symposium; November, 1980 20-21; Solan, India. Solan, India: Indian Society of Tree Scientists: 175-81

Fodder trees in Himachal Pradesh.
Negi, S. S. Indian Vet. Res. Inst., Patampur, Himachal Pradesh, India. Indian Forester, 1977, Vol.103, No.9, pp.616-622, 14 ref.
(Journal article, isbn: 0019-4816)