GREEN ENERGY

NEWS LETTER
Bio Energy Association of Sri Lanka

2013
APRIL

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AGM Held on 14th March 2013 @ Foundation Institute

At the **BEASL AGM** held on **14th March 2013** at the **Foundation Institute**, the following were elected to the Executive Committee.

Hon. President – Eng. L P Jayasinghe
Hon. Vice President – Group Capt. Nalin De Silva
Hon. Secretary – Eng. P G Joseph
Hon. Treasurer – Mr. N Nagasinghe
Committee Members –
Mr. Chamil De Silva, Capt. Nalaka Gunasinghe, Mr. Haresh Karunanayake, Mr. J C A Abeyratne
Mr. Melvyn Samarasinghe, Mr. Manoj Jayamaha, Mr. P R Wijewardena, Mr. Gamini Ranasinghe
Mr. Justin Seneviratne.

The AGM followed by a public seminar attended by over **60 participants**. Several presentations were made. At the end, all the participants joined a dinner hosted by BEASL.

1. **The Secretary to the Min. of Environment & Renewable Energy** spoke on the need to meet environmental and energy crisis faced by the country and the need to find alternative means to meet energy and fertilizer requirements.
   He promised to extend full cooperation of the ministry towards the efforts made by BEASL in this direction.

2. **Dr. Lionel Weerakoon** explained the work that has been done over the last 25 years to promote gliricidia as a soil supplement and as fuel for domestic needs.
   He described the work that is being done now in Vavunia and Mannar, under an IOM project to promote sustainable livelihoods. Gliricidia is being grown as an intercrop to meet the needs of fertilizer and firewood. He said a half an acre plot with gliricidia grown on the fence would a supply adequate wood for domestic cooking of a farmer family.

3. **Dr. Jayantha Gunathilaka** explained the work that has been carried out at Ratmalgara Coconut Plantation where an integrated approach to meet fuel, fodder, fertilizer is being carried out. It has evoked much interest not only locally but also of other counties.

   The project uses gliricidia to feed a buffalo farm, and the waste is fed to a biogas generator. The extra fresh leaves are used as soil additive and the sticks are sold as fuel to a dendro power producer.

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President's Report Highlights…

The year 2012 showed an unprecedented import bill on fossil fuel exceeding US$ 6 Billion. This is more than **30%** of total export earnings and exceeds total earnings from tea, rubber and coconut exports.

The first phase of the 2.5 MW Dendro power plant at Tirippane, of 500kW, was commissioned and a new 1.5MW project is being commissioned.

10MW project at Kumbrukka has commenced initial construction work. Further 21 projects with a total capacity of **115MW** are held in abeyance till the new tariff structure is approved.

With the creation of new ministries, SEA now comes under the purview of the Ministry for Renewable Energy. **SEA** is yet to carry out an assessment of biomass resources but an independent study is being carried out at the moment.

CEB has undertaken augmentation of substations which will be an advantage to dendro power developers in the future.

BEASL is collaborating with **Mahatma Gandhi Center** and **Sustainable Agricultural Research and Development Centre** on a pilot project in Vauniya.

BEASL had to manage without adequate staff during the year, however this will be corrected soon. BEASL has posted a web page www.bioenergysrilanka.orgwhich has evoked interest locally and from other countries. This web portal will be updated with current information and literature review that are being undertaken by the staff.

The main problem confronting the developers is a reliable supply of fuel wood. BEASL would be addressing this issue as its major priority during the current year.

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Workshop and demonstration on zero-budget farming @ Vauniya Army Camp on 9th April

The workshop was jointly arranged by **SARD, BEASL** and **MGC** with the assistance of the personnel at the Vauniya Camp to share the technology of zero-budget farming based on **Sabash Palekhar's** concepts developed in India.
Representatives from five villages in the district and the officers of the five camps located in the area took part in the workshop.
A gathering of over **100** participants were addressed by **Eng. Parakrama Jayasinghe**, **Dr. Lionel Weerakoon** and **Dr. Gamini Kulatunga.**

Mr. Jayasinghe spoke on the need to meet domestic energy needs as well as making farming sustainable by moving away from high-cost fertilizer and depending on local resources, especially gliricidia for fodder, fertilizer and fuel.

Dr. Weerakoon explained the basics of zero-budget farming and why a change is needed to meet challenges faced by marginalized farmers now made viable by a huge subsidy on fertilizer which will become non viable in the near future.

Dr. Kulatunga elaborated on the role played by BEASL as a partner in the effort to assist farmers with the meager resources at their disposal.

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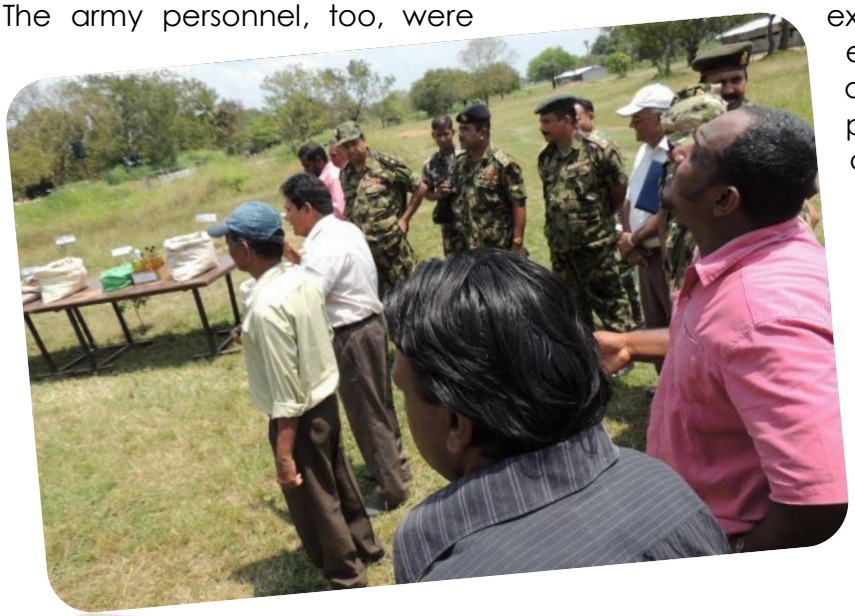
After the introductory session, **Dr. Weerakoon** assisted by his staff conducted a practical demonstration on making compost, jivamurita, establishing a home garden with local inputs without using external inputs. The need for growing gliricidia to meet the objectives was demonstrated and how to establish a gliricidia plantation as an intercrop was demonstrated.

At the end of the demonstration a feed-back session was conducted to share the experience of farmers and to assess individual needs to be met.
The next stage of the project would be to establish five demonstration plots in selected villages with the assistance of the army. These will act as model farms to be used to disseminate knowledge and practices suitable for each location.

At the moment **BEASL**, in consultation with **SARD**, is drawing up plans for the next stage and BEASL would fund this phase initially.
MGC was instrumental in organizing the workshop by communicating with the army personnel involved.
The army personnel, too, were extremely cooperative and enthusiastic about the project and some are already practicing sustainable farming on their own.



by Dr. Gamini Kulathunga

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Alternative agriculture

There is increasing concern about fertilizer subsidy which is costing nearly **Rs. 50 billion** to the exchequer, which would increase further with the oil prices in the future. Composting on a large scale is recommended as an alternative. But a realistic assessment of compost making, transport and application has not been done.

Large compost dumps will invariable produce **leacheate** and **methane** if proper measures are not adopted. Both these byproducts are harmful to the atmosphere, **leacheate** would pollute the soil and water while methane would pollute the air and it is more than **20** times as harmful as carbon dioxide as a green house gas.

Composting is done in cold climate to generate sufficient heat within the heap to activate the microbes. Whereas, it could be done in situ in tropical climate and that had been the practice in the past. This avoids handling and waste of nutrients that takes place in centralized facilities.

www.backyardecosystem.com

There are several alternatives which are listed below which would be more farmer-friendly and environmentally friendly, too.

This a comparison of some other means adopted to enrich soil to promote farming with and without synthetic fertilizer.

The need to find alternative means, especially in Sri Lanka that imports chemical fertilizers and distribute with a heavy subsidy that costs foreign exchange, and **Rs. 50 billion** locally, is an important issue.

bamfieldgreenthumb.blogspot.com

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Apart from the cost involved, the embedded energy in fertilizer production which amounts to **50- 60 MJ/kg** has to be addressed in an energy-depleted economy.

1. **Organic Farming: Sustaining Earth and People** - Richard Thornton Smith

Application rates of compost

Crop type	Light Soil	Heavy Soil
Heavy feeder	20 tons/acre	15 tons/acre
Moderate feeder	15 tons/acre	10 tons/acre
Light feeder	1-2 tons/acre	½ tons/acre

2. **System of Rice Intensification (SRI)**

SRI methods can, and should always be adapted to farmers' own local conditions. Farmers in India, Myanmar and the Philippines have adapted SRI concepts and practices for non-irrigated rain-fed SRI. They have **achieved average yields as high as 7 tons per hectare**. Some farmers are adapting the ideas for direct-seeding rather than transplanting rice, and some have adapted SRI to zero-tillage and raised-bed cultivation (e.g. China). Other farmers are applying SRI concepts to other crops like wheat, sugar cane, finger millet, and mustard. Farmer innovation is encouraged as part of SRI.

Initially SRI was developed using chemical fertilizer. However, the best results in SRI have come with the application of organic fertilizer or compost. **As much organic matter should be added as available, but 2 tons of can be sufficient to begin with.** Compost can be made from *any decomposed biomass* – rice straw, garden weeds, crop residues, garden waste, animal manure, kitchen waste, or half burned paddy husk.

www.flickr.com

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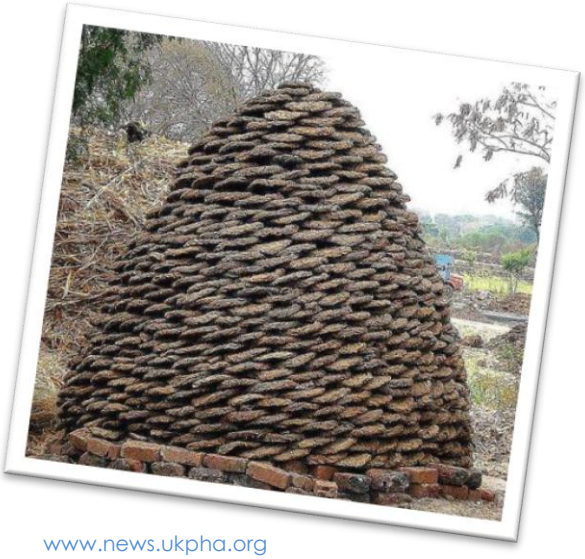

www.news.ukpha.org

Nature Farming - Subash Palekhar

a. Farm Yard Manure

For the growth and production of any crop on earth, there is only a need of two bags (**100 kg** - this includes animal bedding) of sifted farm yard manure per acre.

b. Jivamurta

To prepare 200 l of Jivamurta, sufficient for one acre per month, only 10 kg of cow dung and 10 l of cow urine are sufficient.

Note: On the average a cow produces the following quantities of waste in kg per day:

Dairy cow	45-50 (liquid)	6.3 – 7.0	(solid)
Beef cow	25-30 (liquid)	3.5 – 4.2	(solid)

Source: http://www.siteresources.worlbank.org/INTAPCFORUM/…/part3.ppt-accessed on 9/1/13

The solid content is assumed to vary from **13-15%** depending on feeding regime. These figures are applicable to cows kept within a covered space. On the other hand if stray cattle, tethered only in the night in a paddock, are concerned the quantities would drop by **50% to 30%** depending on period of free grazing and the type of paddock.

It would be prudent to assume an average of around **3 kg** per day and **2 kg** per day for dairy- and beef-cows that are tethered only in the nights.

In three days the required amount of cow dung for one acre could be collected.

In one month a cow will produce enough to supply 10 acres with Jivamurta.

www.healthveda.com

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3. Growing Gliricidia for soil enrichment

It is generally assumed that **50kg** of fresh leaves of gliricidia would replace **one kg** of nitrogen in the form of urea. This does not take into account the nitrogen fixed by root nodules that occur when gliricidia is grown in situ. Especially with cattle allowed to graze or forage in the area the nitrogen pick up is much higher as reported in a study were the leaves were removed from the grazing ground.

Knowledge of the status and dynamics of soil N is essential to improving the production and management of silvopastoral system in the tropics. Soil N status and dynamics were analyzed as key factors affecting productivity and sustainability of a cut-and-carry silvopastoral system. The total soil N and N mineralization as affected by soil moisture and temperature were studied in a Gliricidia sepium (Jacq.) Walp — Dichanthiumaristatum (Poir) C.E. Hubbard grassland association and in an adjacent open grassland located in a subhumid tropical region. **The plot was installed in 1989 and the pruning residues and cut grass were removed from the site. No N fertilizer was applied. Total soil N increased at an average rate of 180 kg N ha−1 in the 0–0.2 m soil layer of the silvopastoral plot.** Only a third of this value could be explained by the litter, nodule and root turnover. Nitrogen mineralization in both soils varied as a function of temperature but it was not affected by soil moisture. Even if mean soil temperature was 1 °C to 2 °C greater in the open grassland, the estimated daily rate of in-situ N mineralization was 20% greater in the silvopastoral system. Our results indicated that greater N mineralization in the silvopastoral system was due to greater soil biological activity associated with higher soil organic matter rather than due to more favorable soil temperature and water conditions.

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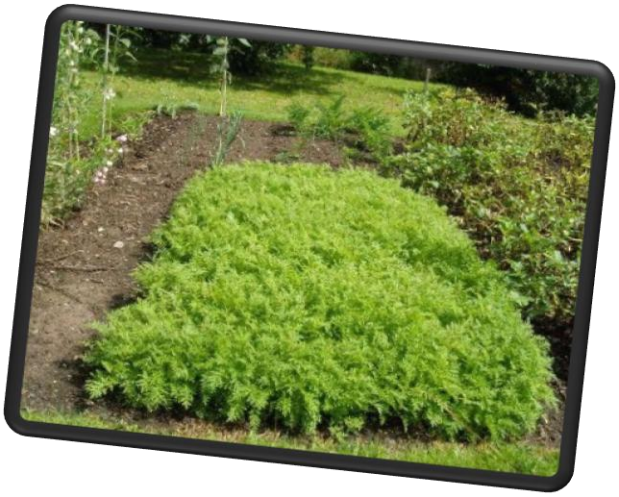

4. In -situ and outside green manures

The Principles of **Green Manuring** and their applications in Ceylon – **Dr. A.W.R. Joachim**
(A Manual of Green Manuring 1930)

www.gardenofeaden.blogspot.com

The green material may be grown in situ or brought from outside. It is commonly believed that only leguminous plants are beneficial as green manures, but this is not the case. Non-leguminous leafy material can be used for green manuring provided it is brought from outside and not grown on the area which is to be green manured. Leguminous plants are of value as green manures because of the large amounts of gaseous nitrogen they fix in the soil through nodules on their roots. Most of the nitrogen contained in the leguminous plants comes from the atmosphere. The presence of m nodules on leguminous roots is always an indication of nitrogen-fixation.

www.vgavic.org.au

All leguminous plants are not however nitrogen fixers. Further, varieties which normally produce nodules on their roots may not do so under certain conditions. Either the soil may not contain the specific bacteria necessary for nodular development, or, it may be so acid that the organisms are destroyed, or it may supply such large quantities of available nitrogen to the legumes at all stages of their growth, that the latter will assimilate the nitrogen supplied and not fix any of, or all, the nitrogen they require, which they would do if the soil were not so fertile.

The greater part of the available nitrogen formed in the nodules is transferred to the stems and leaves where it is converted into organic nitrogen, but some of it is assimilated by the bacteria in the nodules or goes into the roots. When, therefore, leguminous plants that produce nodules on their roots are grown in a soil, they can be expected generally to increase the nitrogen content of the latter to a small degree.
On the other hand, though non-leguminous plants may contain large amounts of nitrogen, they take all of it from the soil. When these crops are turned into the soil on which they are grown, no extra nitrogen is added, but the available nitrogen assimilated from the soil is merely returned to it in organic form.

by Dr. Gamini Kulathunga