

BIOTECH PARK, LUCKNOW
JATROPHA BRAIN STORMING WORKSHOP
MARCH 7, 2009

Biotech Park, Lucknow organized a Brain Storming Workshop on Jatropha on March 7th, 2009 in collaboration with Association of Knowledge Workers Lucknow (AKWL). The programme was sponsored by the Research Design & Standard Organization, Lucknow (RDSO). The workshop was attended by nearly 80 participants from industry (such as Shell Biotech, Bangalore; Green Oil, Udaipur; Hindustan Bioenergy, Lucknow; Natural Wellness, Lucknow; Bharat Petroleum etc.); Representatives of RDSO, North-Eastern Railway, Northern Railway, Power Corporation, Department of Biotechnology, Government of India, Discovery Park, Raibareilly; State Government officials from Planning, Horticulture; senior research scientists from HFRI, Shimla; NBPGR, New Delhi; MSSRF, Chennai; TERI, New Delhi; Thappar University, Patiala; CST, Hissar; NBRI, Lucknow; IITR, Lucknow; Amity University; NGO's such as Haryaali and others interested in Jatropha Cultivation and production of biodiesel.

Dr. Shishir Dutt, Executive Director, RDSO, Lucknow was the Chief Guest and Dr. Rakesh Tuli, Director, National Botanical Research Institute, Lucknow (NBRI) presided over the function. Mr. Anirudh Gautam, Executive Director (CNG), RDSO; Dr. G.N. Pandey, Ex-Vice Chancellor, JRH University, Chitrakoot; Dr. Anil Mukhopadhyaya, Ex-Vice Chancellor, Pantnagar University; Sri P. S. Ojha, State Coordinator, Jatropha Mission Cell, U.P.; Dr. Meenakshi Munshi, Director, DBT and Dr. P.K. Seth, CEO, Biotech Park, Lucknow were the Guest of Honour. Dr. H.M. Behl, Consultant, Biotech Park, Lucknow and Dr. B.N. Mishra, Head, Biotechnology, Institute of Engineering and Technology, Lucknow (IET) were the coordinators of the programme. The participants deliberated on two major themes:

- ? Issues related to cultivation of Jatropha by Railways, availability of biodiesel for RDSO, testing and analysis and utilization of biodiesel by Indian Railways.
- ? R&D needs, state of art and issues that need immediate attention.

Dr. Rakesh Tuli, Director, NBRI in his Presidential address highlighted the need for R&D. He gave example of maize and cotton where agriculture and biotechnology inputs have resulted in increasing the yields of these crops to 4-10 times then the generic material. He said only concentrated research efforts can increase the yield and meet the expectations.

Dr. Shishir Dutt, Executive Director, RDSO gave a status report of quality assurance testing of biodiesel in loco-engines of Indian Railways. He informed about a successful test run of Jan shatabdi from Lucknow to Allahabad for five days using biodiesel. He was confident that loco-engines can be run on 5-20% biodiesel without any problem. However, availability of feedstock and subsequently biodiesel, reliable testing facilities of biodiesel samples preferably in Lucknow and standardized protocols in particular involving heterogeneous catalyst for biodiesel conversion are the critical issues currently being faced by RDSO and Indian Railways. He felt the need for proper plantation technologies so that sufficient feedstock is available to meet the demands of Railways.

Mr. Anirudh Gautam, Executive Director (CNG), RDSO informed the house that Railways have created a board for biofuel with a core committee of experts to look into the matters faced by Indian Railways in biodiesel. He also informed that not many parties came forward when a tender for plantation of Jatropha on Railways land was floated by Indian Railways. He was quite optimistic of the technical feasibility of using Jatropha biodiesel for running diesel engines by Indian Railways, the biggest consumer of diesel in the country.

Inline with the discussions on research, Dr. P.K. Seth, CEO, Biotech Park emphasized the importance of quality planting material to be used for plantation to optimize productivity.

Dr. Anil Mukhopadhyaya, Ex-Vice Chancellor, Pantnagar University, the panelist and Chairperson of one of the sessions advised that the programme should be taken as the mission. Dr. G.N. Pandey, Ex-Vice Chancellor, JRH University, Chitrakoot and Coordinator, Discovery Park, Raibareilly called for transparency in biodiesel programmes, use of internet for sharing success and failure stories and case studies, interlinking of biodiesel related websites and efficiency and accountability of programmes run by various networks. He also suggested that negative issues should be answered preferably on the internet.

Sri P.S. Ojha, State Coordinator, Jatropha Mission Cell, U.P. proudly informed that the Public-Private Partnership (PPP) model of biodiesel value chain of U.P. is a success story in the country. Partnership of a private company and a corporation (Bharat Petroleum) with U.P. Government in the lead role is a great success. He invited young entrepreneurs to be a part of the chain since the plantation and extraction of oil has been decentralized by opening several satellite units in the State.

Dr. Meenakshi Munshi, Director, DBT informed the house of the programmes initiated by DBT under Jatropha Micro mission network which is being coordinated by Dr. H. M. Behl. She informed that scientists (CSIR, Forest Institutes, Universities and other research institutes) have collected nearly 1500 accessions, which have been evaluated at 15 institutes. The selected accessions are being evaluated at another 10 institutions under multi location trials with the objective of optimizing productivity and availability of quality planting material in the country.

Dr. H.M. Behl, Coordinator of the programme, while replying to several queries of the participants informed the house of the networks on Jatropha plantation in the country and the DBT website (www.dbtjatropha.gov.in) that can be used by the entrepreneurs, researchers and also by general public for interaction, communication, knowing about outcomes of government projects related to Jatropha Biodiesel. The website also has an interactive forum.

Based on the deliberations and suggestions of the panelist and senior scientists, the following were recommended:

1. Productivity of Jatropha was found to be the major limiting factor. Several failure stories were narrated such as poor productivity in plantations raised by Indian Railways, seedless fruits in patches of RDSO plants, abortive seeds in some plantation of Thappar University, Patiala, frost damage in plantation at Himachal, etc. It was pointed out that the main cause of the failure is use of generic and unselected planting material. It was recommended that only quality-planting material that has been raised from selected and accessioned (at NBPGR, New Delhi) mother stocks be used. These plants are available at 12 institutions (including Biotech Park, Lucknow) under DBT Jatropha network and similarly institutions under NOVOD Board, Ministry of Agriculture network. The emphasis should be on the quality rather than the cost of the planting material. Plantation of low yielding with poor survival varieties will be uneconomical. Hence, the source of planting material is very carefully selected. Biotech Park shall raise 5 to 10 lakhs of such quality clonally propagated planting material in next six months.
2. Lack of protocols for plantation was identified as another limiting factor particularly by organizations like North-Eastern Railway and Northern Railway. It was recommended that the best practice for plantation that

optimizes productivity of fruits should be obtained from institutions in the above said networks. Information on the web may be sometimes misleading since it is not based on research and actual case studies.

While DBT network institutions are working on further improving these protocols yet sufficient knowledge is available to advise those in modern plantation. Standard protocol should be made available for different level of farmers / entrepreneurs. Biotech Park shall organize a workshop of NE and N Railway in collaboration with RDSO to provide best practices.

3. It was also recommended that the website on biofuels / Jatropha such as those of DBT, Bioenergy Mission Cell, U.P. and Discovery Park, Raibareilly, and others should be interlinked.
4. Success stories of Transesterification using heterogenous catalyst should be posted on website for use of those who are putting up Transesterification plants. One such plant shall be developed at RDSO.
5. Experiments should be undertaken for testing of biodiesel at low temperature.
6. It was also recommended that technology should be developed (efforts already been initiated by IIT, Kanpur) for use of straight purified non-edible vegetable oil for running stationary motors, gensets, etc. in rural areas.
7. The State Departments should form a core group to advise on operations and protocols on the lines of a core committee made by Indian Railways so that Jatropha biodiesel programme is economically feasible and an attractive activity. The drivers of the programme are not only economically

feasibility but utilization of unutilized waste land, reduction in import of diesel and production of indigenous energy and environmental gains.

8. Facilities for the analysis of the oil content and the biodiesel (after Transesterification of oil) be setup in U.P. as already several farmers and companies are planting *Jatropha curcas* and other plants whose seeds would be used for biodiesel. Such facility may be developed at Biotech Park, Lucknow which already has basic analytical facilities.