

VASANTDADA SUGAR INSTITUTE
MANJARI BK, TALUKA HAVELI, DISTRICT PUNE-412 307

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Criterion 7 - Institutional Values and Best Practices

7.1 Institutional values and Social Responsibilities

Report of the activities and Proofs

2018-19



VASANTDADA SUGAR INSTITUTE

Manjari (Bk), Pune- 412307, Maharashtra

05/06/2018

Activity Name: World Environment Day

Activity scope: To aware the students on impact of environmental sciences & its role towards society.

Activity details: VSI celebrated an activity on “World Environment Day” on 5th June 2018. On this occasion, Library have organized book exhibition & focused on display of rare and valuable books of Environmental Sciences from its collection and provided opportunity to enlighten the opinions to the visitors. Student and staff members visited the exhibition.

Participants: All stakeholders of the institute.



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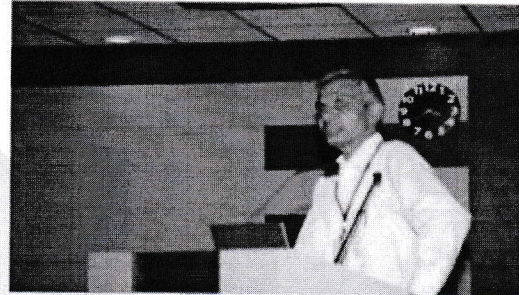
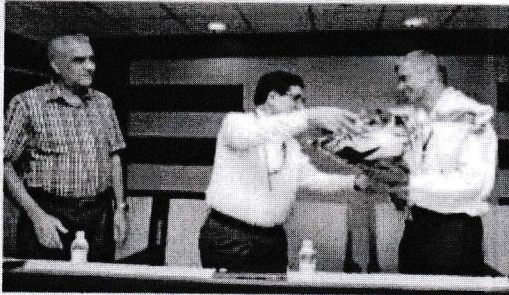


VASANTDADA SUGAR INSTITUTE

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Environmental Sciences, Savitribai Phule Pune University, Pune was invited as honorable guest for this year's function. All the Scientists, Technologists and Engineers of the Institute attended this function. At the outset, Prof. Gosavi was welcomed by Dr. SV Patil, Technical Adviser & Head, Alcohol Technology and Biofuels. Dr. Deepali Nimbalkar Sr. Scientist, Environmental Sciences Department introduced him to the audience. Prof. Gosavi gave a talk on 'Use of Nanotechnology for Sustainable Development'. He gave an overview of the various projects being conducted in the Department of Physics at SPPU and the funding received from national and international agencies. His speech covered three areas viz, solar energy for rural development, nanotechnology in water & wastewater treatment and nanotechnology in health care application. The first part elaborated on the solar energy project at Shive village near Bhama- Ashked dam in Pune district. This project uses solar

energy during day time and biomass energy when sunlight is not available. He explained how this unique project has made a change in the livelihood of villagers and is also used as a live laboratory by students of the university. Prof. Gosavi talked about the use of nanotechnology in water and wastewater treatment and informed use of nano particles for removal of various components from water and waste water in different application. The final part of the lecture dealt with the use of nanotechnology in health care with a stress on technologies for early detection of cancer. He gave details about the status of different developments with an example of early detection of breast and prostate cancers through markers. The address was concluded with a summary and answering the questions raised by audience from the audience. The function was concluded by vote of thanks.




World Environment Day

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25/01/2019

Activity Name: Integrated approach to enhance economic yield of sugarcane and its bye-products

Activity scope: The make aware about ecofriendly practices for sugarcane production

Activity details:

The seminar was organized in the presence of Mr. Sharadchandra Pawar, Hon. President of VSI on "Integrated approach to enhance economic yield of sugarcane and its bye-products" at Vasantdada Sugar Institute, Pune on 25th January 2019, which was coordinated by Science and Technology Park (Institute promoted by Ministry of Science & Technology, Govt. of India).

The discussions were focused on the following topics:


- Eco-friendly ways of increasing yield of sugarcane and decreasing use of pesticides
- Enhancing sugar quality and increasing extraction yield from cane while crushing
- Increasing alcohol percentage in distillery.
- Bagasse- Multiple products increasing economic yield.
- Spent wash and press mud- efficient treatment.

On the above topics, the presentations were made by Dr. Rajendra Jagdale, Director General, Science and Technology Park, Dr. Sheshadria, Chennai, Dr. Chanakya, Indian Institute of Science, Bangalore, Mr. Shiva Subramaniam, Mr. Rajpal Navalkar and Dr. Solayappan.

On this occasion Mr. Dilip Walse-Patil, Hon. Vice President of VSI, Chairman National Federation of Cooperative Sugar Factories Ltd., Trustees and Council members of VSI, Mr. Shivajirao Deshmukh, Director General, Mr. Vikas Deshmukh, Director, AST, VSI and Head of the departments of Technology and Agriculture Division, 25 leading sugar mills viz. Chairmen, Managing Directors, Chief Engineers, Chief Agriculture Officers and Distillery Managers were participated in the program.

During the discussion, DG, VSI, raised the issue regarding Techno-Economical viability of the technologies suitable for sugar industry and allied bye-products. Shri Sharadchandraji Pawar suggested studying various innovative technologies to be adopted in the sugar industry and allied bye-products to enhance the progress of sugar industry in collaboration with Science and Technology Park, Govt. of India.




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VSI Bulletin - Vol-19, Issue-1
January to March 2019

Integrated Approach to Enhance Economic Yield of Sugarcane and its Bye-Products

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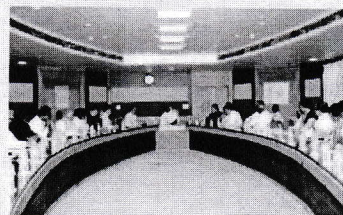
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25/01/2019

Activity Name: Multi-Ratooning in Sugarcane and in situ Trash Management

Activity scope: The make aware about trash management in sugarcane cultivation

Activity details:

A one-day workshop on 'Multi-Ratooning in sugarcane and in situ trash management' was organized at Vasantdada Sugar Institute, Pune on 25th January 2019. Total 87 participants from 37 sugar mills of Maharashtra were attended the workshop. Mr. Vikas Deshmukh, Director, Agricultural Sciences & Technology and Head of the sections from VSI inaugurated the workshop by lightening the lamp. Mr. PV Ghodke, Scientist & Head, Agronomy Section in his, welcome speech highlighted the background and importance of topic of the workshop.

In the technical session, Mr. PV Ghodke made a presentation on 'Multi-ratooning in Sugarcane and in situ trash management.' He highlighted the benefits of ratoon crop, factors affecting low productivity and described advanced cultivation technologies in ratoon management. He suggested appropriate selection of sugarcane variety having good ratoonability, planting season and integrated ratoon management practices viz., trash mulching, stubble shaving, off barring nutrient management with crow bar, with foliar application of liquid fertilizers and biofertilizers are the important components for successful ratoon crop production. Dr. Preeti S. Deshmukh, Scientist & Head, Soil Science Section, talked on 'Efficacy of macro and micro nutrients as foliar application on sugarcane crop' and emphasized on fertilizer application on the basis of soil testing.

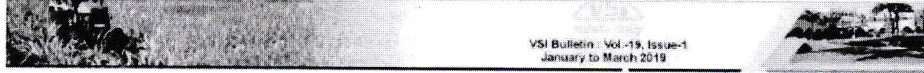


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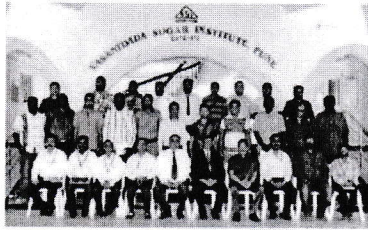
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industry in republic of Fiji, in future. Mr. Shivajirao Deshmukh, DG, VSI, put forth the final remark in the valedictory function. He thanked all who concerned to conduct of course and expressed his views about the

prosperity of the sugar industry in Fiji. He also assured to help Fiji Sugar Corporation in days to come as regards to cane development and to improve efficiency of the sugar mills in Fiji. The function concluded with vote of the thanks by Mr. BH Pawar.



WORKSHOP

Multi-Ratooning in Sugarcane and *in situ* Trash Management

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23/02/2019

Activity Name: Workshop on Sugarcane Crop Management under Water Stress Condition

Activity scope: The make aware about crop management under water stress condition

Activity details:

The activity of monthly workshop is well admired among the cane officers from the sugar mills in the state. As a part of the extension activity the monthly workshop was organized on 'Sugarcane crop management under water stress condition' on 23rd February 2019. Total 68 participants from 36 sugar mills were present during workshop. This workshop was deal with efficient use of available water, nutrient supply and agronomic practices followed during water stress condition. Water, nutrient and agronomic practices will play vital role in adverse climatic condition.

The event was inaugurated in presence of Mr. Vikas Deshmukh, Director, AST and Head of sections, VSI and representative from the sugar mills by lighting the traditional lamp. In inaugural speech, Director briefed the important practices and management carried during the water stress condition.

In the technical session, Mr. PV Ghodke delivered the lecture on 'Agronomic practices in sugarcane under water stress condition'. He explained about overview of situation during summer and drought period, agronomic practices to be followed in drought situation. Mr. PP Shinde, Scientist & Head, Agriculture Engineering Section, talked on 'Water management in sugarcane under water stress condition'. He pointed that untimely and uneven distribution of rainfall results in limitation of water availability. Water always plays a pivotal role in improving crop productivity and sugar recovery. He suggested different water management practices needs to be followed under limited water availability as well as water stress condition. Dr. Preeti Deshmukh, Scientist and Head, Soil Science section presented the topic on 'Nutrient management in sugarcane under water stress condition'. She stated about the ecological requirement of sugarcane crop. Generally, drought reduces both nutrient uptake by roots and its transport from root to the shoots because of restricted transpiration rates and impaired active transport and membrane permeability.



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biofertilizers produced at VSI and their benefits in cane productivity. Dr. SG Dalvi, Scientific Officer, Tissue Culture section gave information about Vasant-Urja, a biostimulator prepared by VSI in collaboration with BARC, Mumbai. He described its effect on increase in productivity and drought tolerance. Mr. GG Ukirde, Chief Agri. Officer, Shri Vighnahr SSK Ltd: Dist. Pune presented the ratoon management schemes implemented by the sugar mill. Mr. MR Bhadule, Chief Cane Development Officer, Vitthalrao Shinde SSK Ltd., Dist. Solapur told regarding cane development activities implemented by sugar mill especially during drought situation to

increase the cane availability in their operational area. In the concluding session, Mr. Vikas Deshmukh, Director, AST stated the present situation of ratoon crop under drought situation in the sugar mills area and its effect on recovery and average cane yield in Maharashtra state. Mr. Shivajirao Deshmukh, DG, VSI addressed to the gathering and expressed the need to give attention towards the increase the ratoon productivity by implementing best management practices, field demonstrations and various cane development schemes by each sugar mill for the benefit of farming community. The program was ended with a vote of thanks by Mr. PP Shinde.

Workshop on Sugarcane Crop Management under Water Stress Condition

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under moisture stress condition, fertilizer application should aim at developing a deeper root system and adequate tillering before water/moisture stress. During the moisture stress period, foliar application of fertilizers is only useful and emphasized fertilizer should apply in soil after achievement of favorable moisture level with availability of water in the canal or by southwest monsoon rain.

The representatives from sugar mills viz. Shri Chhatrapati Shahu SSK, Samarth SSK, SMSMP SSK and Jawahar SSK explained the efforts made by them to save sugarcane crop during the water stress condition and the sugarcane response by application of foliar application of multi micro nutrient and multi macro nutrient fertilizer in sugarcane.


Dr. RS Hapase, Principal Scientist & Head, Plant Breeding section, briefed the progress of promotional award scheme and aware for the next month workshop on promotional cane development award. All Head of sections discussed with the participants for various issues related workshop. The programme was concluded with a vote of thanks with following recommendation;

1. In standing sugarcane, de-trashing of dried leaves can be followed by leaving 3 to 4 border rows or followed by mulching intercropping with suitable green manuring crops. In wider row and paired row planting method the light inter-cultivation / harrowing operation may be done. Mulching helps to reduce the loss of water from soil through evaporation and saves 25 to 30% water.
2. *In situ* trash mulching should be done in ratoon crops. *In situ* trash mulching without shredding is a highly useful technique to conserve soil moisture and reduce the impact of moisture stress and atmospheric draught.
3. In paired row planting, the irrigation should be applied through a long furrow between the rows

of sugarcane. In conventional system a long furrow method, irrigate the crop in alternate furrows. In wider row planting method, irrigate all the furrows up to final earthing-up and there after follow alternate furrow irrigation.

4. Drip and raingun sprinkler irrigation can be effectively used for survival of sugarcane crop in water stress condition.
5. Combined foliar application of Urea and Murate of Potash (White potash) each at 2.0% concentration (2.0 kg Urea + 2.0 kg Potassium in 100 lit. of water) at 15-20 days interval is helpful to retain more number of vigorous shoots till the moisture conditions become favourable.
6. Foliar application of VSI's multi-macronutrient and Multi-micronutrient 2 lit/acre in 200 lit. water at 60 days after planting and 3 lit./ acre in 300 lit. water at 90 days after planting along with Vasanturja, a biostimulator @ 5 ml/lit. of water during both the applications boosts the growth of sugarcane.
7. In water stress condition, foliar application of plant health @ 1 lit/acre mixed with 200 lit. water at 75 days after planting and ratooning can also work for fixing the atmospheric nitrogen efficiently and it will sustain the growth of sugarcane.




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25/02/ 2019

Activity Name: One day Awareness workshop on “Recent Developments in Environment and Safety in the Sugar and Allied Industry”

Activity scope: The make aware about significance of environment and safety in sugar and allied industry


Activity details:

The significance of environment and safety in industrial operations cannot be overemphasized, more so in sugar and allied industry. The industry is the backbone of the rural economy yet in recent times it has been the focus of criticism over excessive water usage and water pollution. There have also been incidences and accidents which point to the lack of adequate industrial safety. Such incidences have also caused environmental concern. Recently, there have been new notifications regarding environmental clearance for sugar and distillery projects vis-a-vis the National Biofuels Policy as also the use of groundwater (CGWA). These will have an impact on the sugar and distillery industry.

Considering the above, a one-day awareness workshop on ‘Recent developments in environment and safety in the sugar and allied industry’ was organized at Vasantdada Sugar Institute on 25th February 2019. Dr. Amol Deshmane welcomed all the guests and requested the Director General welcomed the Chief Guest, Mr. Shekhar Gaikwad (Sugar Commissioner). This was followed by an introduction to the theme of the workshop by Dr. Deepali Nimbalkar and an address by Mr. Shivajirao Deshmukh, DG, VSI which focused on the significance of environmental issues for the industry and VSI’s role in approaching them. Mr. Shekhar Gaikwad, in his inaugural address, advised the environmental officers to work with dedication and follow every norm strictly to minimize the impacts due to sugar industry and distilleries. He suggested making a pollution inventory for sugar and distillery industry along with regular self-audits & third part audits once in three years.

This workshop was arranged in two sessions, Technical Session I- Safety & Technical Session II- Environment. Mr. Isak Mujawar gave the first talk on general safety guidelines for the sugar and distillery industry (including HRA). He explained the terms as Hazard, Risk and how to identify and control hazard as well as risk. He suggested setting up an emergency exit plan for worker’s safety. The second lecture on PESO Guidelines for ethanol storage was delivered by Mr. Prakash Patil who explained The Petroleum Act, 1934 and Rules, 2002, in detail with the rules for import, transport & storage of petroleum and also the criteria for license. The final presentation in this session was made by Dr. Eknath Alhat, VSI who elaborated on the safety issues in Effluent Treatment Plants.




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Recent Developments in Environment and Safety in the Sugar and Allied Industry

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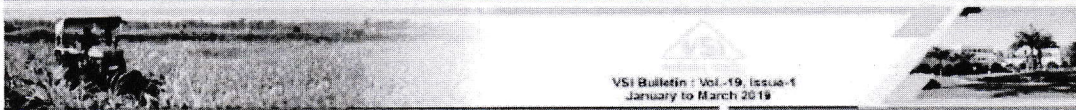
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In the second session on environmental issues, Dr. SV Patil, Head & Technical Advisor, Dept. of Alcohol & Bio-fuels explained the various alternatives available to the distillery industry for achieving zero liquid discharge. The final talk was delivered by Dr. Deepali Nimbalkar on recent EIA Notification and its implications for sugar and distillery industry. She explained in detail about the notifications pertaining to the distilleries regarding fuel ethanol projects as also the EIA notification on violation projects. She also enlightened briefly about the draft notification regarding extraction of groundwater.

The workshop received a very good response with 79 participants who were active in the deliberations. All

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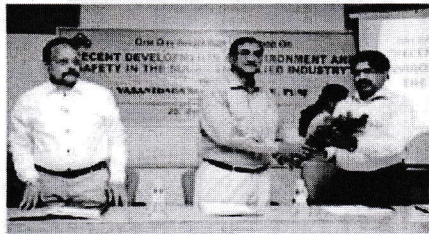
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the speakers received several questions which were answered to the satisfaction of the participants. Many participants requested VSI to arrange such workshops twice a year, so that they remain updated and it helps

to follow specific process and implementation of norms to take care of environment and to improve the status of mills as well as workers. The workshop ended with vote of thanks by Mr. Vivek Patil



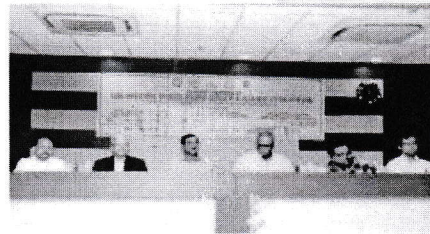
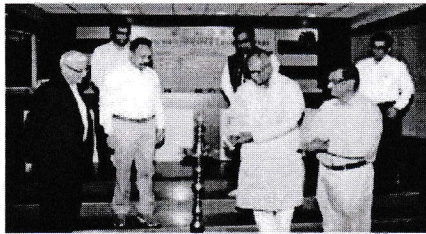
Valorising waste (vWa) from Sugarcane Industries via Innovations in Pre-treatment, Bio-production and Process Intensification

One day awareness workshop on 'Valorising waste (vWa) from sugarcane industries via innovations in pre-treatment, bio-production and process intensification' was held on 5th March 2019 at Vasantdada Sugar Institute (VSI), Department of Alcohol Technology & Biofuels.

Dr. Indrajeet Mohite, Prof. Vivek Ranade, Mr. Vijaykumar Goel, Prof. Vivek Kumar and Prof. Yogendra Shastri present on the dais. Introductory remarks on vWa project were delivered by Prof. Vivek Ranade. He explained the basic concept to valorize these wastes into bio-gas, lactic acid, succinic acid and bio-butanol.

Total participation in the workshop was about 120 including VSI staff. In Inauguration Ceremony, Dr. SV Patil, Head, and Technical Advisor, Department of Alcohol Technology & Biofuels welcomed all the guests, vWa partners, industry representatives and VSI staff. Mr. Shivajirao Deshmukh DG, felicitated

Mr. Shivajirao Deshmukh, in his inaugural speech, congratulated Prof. Ranade for his vision in formulating a very innovative project and offering a great opportunity to VSI for leading the vWa project from India side. He elaborated on activities conducted by VSI for the sugar and allied industry as well as footprint



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05/03/2019

Activity Name: Valorizing waste (vWa) from Sugarcane industries via innovations in pretreatment, bio-production and process intensification

Activity scope: To create awareness among students about the importance of sugar industry waste for its valorization to different products

Activity details: One day awareness week on Valorizing waste (vWa) from Sugarcane industries via innovations in pretreatment, bio-production and process intensification was organized by Dept. of Alcohol Technology & Biofuels, VSI. Awareness among students about the importance of sugar industry waste for its valorization to different products was created. Students could learn about the importance of the sugar industry waste for Biofuel & biochemicals production.

Speaker details: Dr. S.V. Patil, Dept. of Alcohol Technology & Biofuels, VSI

Participants: Total number of participants was 120 including staff & students



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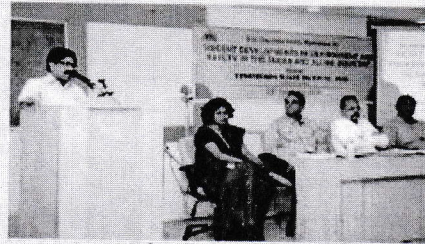
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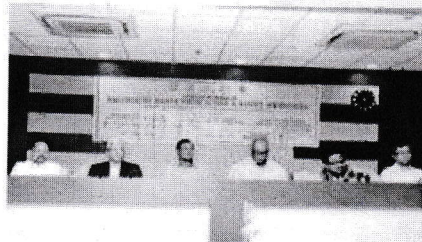
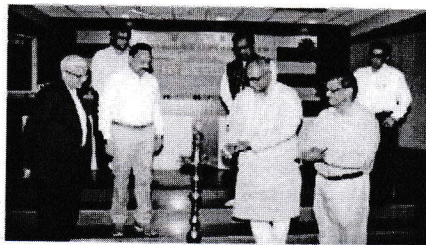
Valorising waste (vWa) from Sugarcane Industries via Innovations in Pre-treatment, Bio-production and Process Intensification

One day awareness workshop on 'Valorising waste (vWa) from sugarcane industries via innovations in pre-treatment, bio-production and process intensification' was held on **5th March 2019** at Vasantdada Sugar Institute (VSI), Department of Alcohol Technology & Biofuels.

Total participation in the workshop was about 120 including VSI staff. In Inauguration Ceremony, Dr. SV Patil, Head, and Technical Advisor, Department of Alcohol Technology & Biofuels welcomed all the guests, vWa partners, industry representatives and VSI staff. Mr. Shivajirao Deshmukh DG, felicitated

Dr. Indrajeet Mohite, Prof. Vivek Ranade, Mr. Vijaykumar Goel, Prof. Vivek Kumar and Prof. Yogendra Shastri present on the dais. Introductory remarks on vWa project were delivered by Prof. Vivek Ranade. He explained the basic concept to valorize these wastes into bio-gas, lactic acid, succinic acid and bio-butanol.

Mr. Shivajirao Deshmukh, in his In his inaugural speech, congratulated Prof. Ranade for his vision in formulating a very innovative project and offering a great opportunity to VSI for leading the vWa project from India side. He elaborated on activities conducted by VSI for the sugar and allied industry as well as footprint





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of VSI on entire sugar industry in India. He also introduced Dr. Indrajeet Mohite to audience and his contribution in the area of sugar and allied industries.

The key note address was given by Dr. Indrajeet Mohite, Chief Guest, explained about the economics of sugar industry and its socio-economical contributions in developing schools, colleges, hospitals and creating jobs in rural India. He mentioned that alternative products can come out from vWa project which will boost entrepreneurship, rural economy, employment and provide additional source of revenue to farmers and sugar industry. He advised the industry as well as vWa project partners to follow the environmental norms to save the mother earth. He thanked Department of Biotechnology, Government of India and Innovate UK for funding the vWa project and Prof. Ranade, Queen's University Belfast, UK for his initiative and effort taken in formulating the vWa project.

In technical sessions-I were chaired by Dr. Indrajeet Mohite. The first presentation on 'Valorizing waste from sugar & allied industries via innovations in pretreatment, bio-transformations and process intensification' was delivered by Prof. Vivek Ranade. He emphasized on quantum of waste generated by sugar industry and distilleries in India. He also mentioned about the sub-optimal utilization of these waste/resources though current practices like burning of cane trash, use of bagasse for cogeneration etc. He then briefed the concept of vWa biorefinery where cavitation and anaerobic digestion (AD) will be used as pretreatment as opposed to use of costly enzymes in 2 G ethanol technologies. He further added that AD will utilize hemicellulose (xylose) in lignocellulosic material for biogas production and the sugar/glucose released from cellulose will be fermented to lactic acid or succinic acid or biobutanol. Lignin can be valorized to multiple products like DNF, HMF etc or incinerated in boiler for steam and power generation.

He also briefed about vWa partners and their role in carrying out this project.

The second technical presentation was delivered by Dr. SV Patil on 'Value added products from waste biomass and SATAT initiative'. He talked about the global initiatives taken by the different countries for biogas production. He also mentioned that the number of biogas plants in Germany has doubled to ~9000 plants from 4136 plants in 2010. He also informed that Oil Marketing Companies (OMCs) have invited Expression of Interest (Eoi) from Entrepreneurs/co-operative societies/technology provider for production & supply of compressed biogas (CBG) and discussed about Ministry of New and Renewable Energy has notified Central Financial Assistance. Further he explained as the distillery biogas plant generally operates 250 days per annum, CBG production plant will run only for 250 days with available spent wash. Therefore, he suggested alternative feedstock such as bagasse, press mud, cane trash etc can be co-digested along with spent wash or digested separately in existing digester for remaining 115 days. Dr. Patil presented three case studies for CBG production and its revenue generation. Dr. Patil presented the lab data on compositional analysis of different sugarcane bagasse cultivars and lactic acid fermentation from synthetic and alkali pretreated bagasse. In conclusion, he mentioned that every sugar mill in country will have CBG plant in future.

In technical session-II, Prof. Ranade talked on 'Enhancing biogas yield via novel pre-treatment' and presented vWa biorefinery stage I approach which is about utilization of bagasse, press mud and/or cane trash in a digester for biogas generation and digestate generated will be used for bio-composting. He described the hydrodynamic cavitation as one of the potential pretreatment method of lignocellulosic biomass. He also described the different ways to generate cavitation and explained how vortex based cavitation (VoDCa) is superior over other technologies.


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04/03/2019

Activity Name: Advanced technologies for improving crop productivity and increasing water use efficiency in sugarcane

Activity scope: The make aware about advanced technologies for crop productivity and efficient use of water.

Activity details:

The training program on 'Advanced technologies for improving crop productivity and increasing water use efficiency in sugarcane' for farmers was conducted in two batches of three days duration at VSI. The training for first batch was conducted during 25-27 February, 2019 in which 180 farmers (134 Men and 46 Women farmers) attended training program. Second batch of training program was conducted during 1-3 March, 2019 in which 195 farmers (179 Men and 16 Women farmers) attended the training program. Both the programs were inaugurated by Director, AST, in presence of farmers, officers from ITC and Head of Departments AST were present.

In training, information of sugarcane varieties released by VSI viz. CoVSI 9805, VSI 434, CoVSI 03102 and VSI 08005 was given to the famers. The proper varietal planning and harvesting program plays an important role in sugar industry for achieving higher cane yield and sugar recovery. The management practices of different varieties were explained to the farmers. The seed is also one of the important inputs in sugarcane production. It is essential to follow three tier seed nursery program for better crop yield. The information of seed production technology including seedling production was given to the farmers. The tissue culture is an advanced technology of fast multiplication of sugarcane varieties and also development of new sugarcane varieties. The sugarcane productivity mainly depends on the various agronomic practices carried out during the crop growth period. The information of preparatory tillage, use of good quality seed, seed treatment, methods of planting, Intercultural operations like earthing up, fertilizer management, weed control, intercropping, crop rotation and ratoon management was given to the famers. Integrated nutrient management is important to boost the crop yield. Organic matter in the soil is an essential component for healthy crop growth that improves soil fertility. It greatly improves physical and biological condition of soils, reduces soil erosion and increases water holding capacity



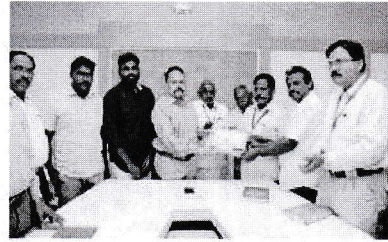
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VSI Bulletin : Vol.-19, Issue-1
January to March 2019



Advanced Technologies for Improving Crop Productivity and Increasing Water use Efficiency in Sugarcane

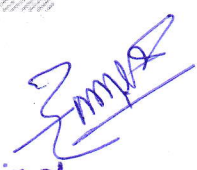
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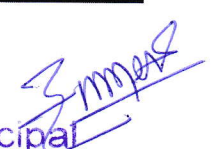
VSI Bulletin: Vol-19, Issue-1
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salinity and drought situations. The overall irrigation efficiency has not been more than 30-40%. Under this scenario it is necessary to adopt modern irrigation techniques like surface, sub surface drip and rain gun sprinkler irrigation needs to be promoted in sugarcane agriculture. The fertigation is also possible with drip and rain gun sprinkler irrigation and water soluble fertilizers can be efficiently applied through these techniques. The modern irrigation technology results in increasing water use efficiency and also for improving the fertilizer use efficiency. The mechanization is also important in the context of untimely and limited availability of man power and increased cost of labour for agriculture purpose. The equipment available for mechanized farm operations were shown to the farmers and insisted for its adoption to bring down the cost of cultivation of sugarcane. Integrated disease and pest management

is very much important in sugarcane cultivation in order to avoid the yield losses due to occurrence of particular disease or pest. Integrated control measures at right time results in minimizing the losses due different pests and diseases. The control measures for various diseases and pests were explained to the farmers. The emerging trend of biological control of various diseases and pests was also explained to the farmers. Participants were also shown various experimental field plots, water management practices, farm implements and tissue culture raised plantlets during the field visit.

Interactive session was conducted after finishing the lectures, practical and field visits. During this session, the queries/questions of farmers were answered. The certificates were given participants at the hands of Director, AST and the program concluded with vote of thanks.




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