2021-22



Manjari (Bk), Pune- 412307, Maharashtra



VASANTDADA SUGAR INSTITUTE

VSI Bulletin : Vol. - 22, Issue - I, January - March 2022



- The planting of drought tolerant varieties like CoC 671, VSI 434 and VSI 08005 should be undertaken in the drought prone area of Maharashtra.
- The early planting (Pre-season planting) should be preferred (October-November) in the drought prone area.
- Distance between two rows can be reduced upto 90 cm in the drought prone area.
- 4. Incorporation of sugarcane trash in soil instead of burning OR in situ decomposition with trash mulching to increase the fertility of soil, it has a major role in soil conservation, checks the weed growth, helps to minimize the impact of water stress as well as salt stress on crop.
- The application of Acetobacter diazotrophicus bioinoculant @ 3 lit/ha in 500 lit of water as foliar application after 60 days of planting in morning hours.
- To control sugarcane mealy bug or scale insects infestation in stress condition by removal of lower 2-3 dry leaves and spraying of imidachloprid 17.8 % SL @ 300 ml/ha (0.3 ml/lit) is recommended.
- 7. For the management of Early shoot borer and Internode borer in stress affected sugarcane crop, the release egg parasitized eggs /ha in suitable instalments in the field and soil application of granular insecticide Fipronil 0.3 GR @ 25 kg/ha or Chlorantraniliprole 0.4 GR @ 22.5 kg/ha or Spraying of Chlorantraniliprole18.5% SC @ 375 ml per ha (0.4 ml/ lit of water) is recommended.
- 8. Under abiotic stress condition the incidence of sugarcane diseases viz, pokkah boeng, rust, red rot, wilt, pineapple and whip smut is increasing as well as abnormalities viz., leaf scorching, drying of leaves, rotting of leaves, decaying of leaves, defoliation and banded chlorosis are also observed. To control these diseases and abnormalities the recommended prophylactic measures should be adopted for the management of sugarcane diseases and abnormities under stress condition.

Valorizing Waste from Sugar & Allied Industries

One-day workshop entitled 'Valorizing waste from sugar & allied industries' was jointly organized by the Department of Alcohol Technology and Biofuels, VSI and UK partners at Vasantdada Sugar Institute (VSI), Manjari (BK), Pune, India on March 31, 2022 with the active participation of sugar mills and distilleries from different States across the Country.



For this workshop following eminent Delegates & Speakers viz, Mr. Jayprakash Dandegaonkar, Chairman, NFCSFL & MRSSK Sangh Ltd., InMr. Prakash Naiknaware, MD, NFCSFL, India, Mr. Sanjay Khatal, MD, MRSSK Sangh Ltd., India; Prof. V. V. Ranade, Professor Emeritus, Queen's University Belfast, UK; Prof. SV Patil, Professor Emeritus, Alcohol Tech &







Manjari (Bk), Pune- 412307, Maharashtra



VASANTDADA SUGAR INSTITUTE

VSI Bulletin : Vol. - 22, Issue - 1, January - March 2022



Biofuels, VSI, India; Prof. Yogendra Shastri, Department of Chemical Engineering, IIT Bombay, India; Mr. Joseph Vimal, MD, J & FBiogas, Chennai, India; Mr. Gajendra Singh, Dhampur Sugar Mills Ltd., UP, India (Online); Dr. Vinod Kumar, Cranfield University, Cranfield, UK (Online); Dr. Ines Baptista, Green Fuels ResearchLtd., Berkeley, UK (Online); Mr. Shivajirao Deshmukh, Director General, VSI, India; Mr. Sambhaji Kadupatil OSD, VSI, India and apart from this, total 133 participant (Sugar Mills: 79 and VSI; 54) were present and

The workshop was inaugurated and welcome address was given by Mr. Shivajirao Deshmukh. He welcomed all the guests, sugar mill representatives and VSI staff. He told that Sugar and Allied Industries has huge opportunities for utilization of sugarcane bagasse (SCB) and press mud cake (PMC) for value added products such as bio-CNG, lactic acid, bio-butanol, succinic acid, xylitol, etc. He informed that VSI has collaborated with NiraBhima SSKL for installation of two pilot scale anaerobic digesters to study various aspects and retrofit Compressed biogas (CBG) facility in existing sugar mill complex.

Introductory remarks were given by Mr. Jayprakash Dandegaonkar. He informed that India is importing 77% crude oil requirements and 50% of natural gas requirement and Government of India has set a target of reducing this import by at least 10% by 2022. He also told that India has set a target of 10% blending of fuel ethanol with petrol by 2022 and 20% blending by 2025 for ethanol blending programme. He also informed that GOI has invited expression of Interest by Oil Marketing Companies (OMCs) for production & supply of CBG under Sustainable Alternative towards Affordable Transportation (SATAT) programme. He further informed that Indian Sugar Mills generates 8-10 million tons of PMC and 100 million tons of SCB every year. He told that both PMC & SCB can be utilized for CBG production through anaerobic digestion (AD). SCB can be used to produce value added products such as bio-ethanol, biobutanol, lactic acid, succinic acid and xylitol, etc.He emphasized that if 50 % of Sugar mills out of total 540 Sugar mills will adopt CBG technology, they will produce 3.75 lakh ton of CBG per annum with revenue of Rs. 1750 crore per annum to India and this will create employment opportunities. He also explained the market potential of lactic acid and succinic acid.

Technical Session-I

During the 1st technical section, Prof. VV Ranade gave a presentation on 'Valorising waste biomass via hydrodynamic cavitation and anaerobic digestion'. He briefly discussed the visions of vWa project. He told that the PMC & SCB produced from sugar & allied industries could be converted in to bio-CNG & other value added products. He specially focused on hydrodynamic cavitation pretreatment method using vortex based devices for cavitation. He also also discussed biogas improvement for spent wash digester on commercial scale using cavitation pretreatment.

The 2^{ad}technical presentation was delivered by Prof. SV Patilon the topic entitled 'Value added products from waste biomass'. Prof. SV Patil started his presentation with the explanation of vWa project concept and the role of VSI in the project. In his talk, Prof. Patil emphasized mainly on bio-CBG and lactic acid production. He also explained about the achievement of biogas production of 480 M³ per ton of dry PMC or 120 M³ per ton of wet PMC. He also explained about the 45% enhancement of biogas production rate in case of PMC feed when the retention time was changed from 30 days to 20 days. On aspect of CBG production, Prof. Patil described 5 different types of CBG production models on Sugar Industry perspective.

The third technical presentation was delivered by Prof. Yogendra Shastrion the topic entitled Technologies for Sugar Industry Waste Valorization: Development and Scale-up Potential'. He explained life cycle analysis for different products (lattic acid, succinic acidxylitol & CBG) in vWa. He mentioned regarding the techno-economic & life cycle assessment of different value added products (Rs. 215/kg lactic acid, Rs. 37/kg of CBG, Rs. 121/kg for succinic acid & Rs. 230/kg for xylitol). He also explained biomethane and lactic acid purification work at IIT Bombay.





Manjari (Bk), Pune- 412307, Maharashtra



VASANTDADA SUGAR INSTITUTE

VSI Bulletin : Vol. - 22, Issue - 1, January - March 2022



Technical Session II

During the 2nd technical session, Mr. Gajendra Singh, Dhampur Sugar Mills Ltd., UP, India gave a presentation on 'Biomethane production: An opportunity'. He explained the single stage anaerobic digestion with cavitation and two stage anaerobic digestion. He explained anaerobic digestion data for 1M³ and 7M³ digester. He also shown flame test for 7M³ digester. He also explained production of volatile fatty acids (acetic, propionic and butyric acids) during biogas production for two stage anaerobic digestion.

The 2ndtechnical presentation was delivered by Dr. Vinod Kumar on the topic entitled 'Sugarcane bagasse-based Production of Biochemicals'. He focused on production of xylitol and succinic acid from SCB. He informed that 102.5 g/L of xylitol was produced through fed-batch fermentation from pure xylose in comparison to 86.6 g/L of xylitol from SCB xylose hydrolysate. He further informed that 36.7 g/L of succinic acid was produced from pure xylose in comparison to 28.7 g/L of succinic acid from SCB xylose hydrolysate.

The 3rdtechnical presentation was delivered by Dr. Ines Baptista on 'Towards biobutanol production: ABE fermentation of sugarcane bagasse hydrolysate'. She emphasized on biobutanol production from synthetic media and SCB hydrolysate containing both glucose and xylose.

The 4th technical presentation was delivered by Mr. Joseph Vimalon on 'CSTR Semi dry fermentation technology'. He described in detail about pros and cons of semi-dry fermentation technology in the field of bio-digestion for various different substrates (paddy straw, press mud, cane trash, Napier grass).

The technical session I & II was coordinated by Dr. Kakasaheb Konde, Head, Professor and Technical Adviser, AT & B, VSI, India.

In the panel discussions, Mr. Shivajirao Deshmukh, Mr. Sambhaji Kadupatil, Mr. Prakash Naiknavare, Prof. Yogendra Shashtri, Mr. SD Bokhare, Prof. Ywek Ranade, Prof. SV Patil and Dr. KS Konde were present on the dias. There was lot of deliberation made on use of vWa technologies for production of value added products (bio-CNG, bio-butanol, lactic acid, succinic acid, xylitol) and their adoption in sugar and allied industries. The participants of the workshop raised many questions and doubts about the use of feed stocks released from sugar & allied industries and necessary explanation were provided by the delegates.

The programme was concluded with vote of thanks given by Mr. Sambhaji Kadupatil.





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Manjari (Bk), Pune- 412307, Maharashtra

10/01/2022

Activity Name: Traditional vs Scientific Technologies for Mahua Spirit and Heritage Alcoholic Beverages Production-Optimization, Evaluation and Training (Heritage Wine Policy)

Activity scope: To educate the tribal people & VSI students on scientific process of mahua liquor production & its optimization.

Activity details: A training programme was conducted from January 10-28, 2022 under the research project entitled 'Traditional vs scientific technologies for Mahua spirit and heritage alcoholic beverages production-optimization, evaluation and training (heritage wine policy)' was carried out by Department of Alcohol Technology and Biofuels (AT& B), VSI. This project is sanctioned by Principal Secretary, Department of Commercial Tax, Govt. of Madhya Pradesh and funded by Ministry of Tribal Affairs, Govt. of India.

Speaker details: Prof. SV Patil, Technical Adviser & Head, Department of AT & B briefly explained to the participants regarding all departmental activities with special reference to the Mahua project such as alcoholic & non-alcoholic beverages, Mahua tree & its importance, traditional vs scientific fermentations & distillation, analysis of total reducing sugar, ethanol & total organic volatile acidity, concept of sensory evaluation, isolation & maintenance of yeast culture, understanding pilot & effluent treatment plant, ideal packaging methods and rules & regulations linked to the Excise Department.

Participants: Total number of participants was 13 (from outside)

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VASANTDADA SUGAR INSTITUTE

VSI Bulletin : Vol. - 22, Issue - 1, January - March 2022



TRAINING

Traditional vs Scientific Technologies for Mahua Spirit and Heritage Alcoholic Beverages Production-Optimization, Evaluation and Training (Heritage Wine Policy)

A training programme for tribal representatives was conducted from January 10-28, 2022 under the research project entitled 'Traditional vs scientific technologies for Mahua spirit and heritage alcoholic beverages production-optimization, evaluation and training (heritage wine policy)' was carried out by Department of Alcohol Technology and Biofuels (AT& B), VSI. This project is sanctioned by Principal Secretary, Department of Commercial Tax, Govt. of Madhya Pradesh and funded by Ministry of Tribal Affairs, Govt. of India.

Total 13 participants and Mr. Annudh Mookerjee, project consultant attended the training programme. The participants were from Dindoriand Alirajpur Dist. of Madhya Pradesh (MP) and most of the participants were tribal people. Participants were from various backgrounds such as farmer, Excise Officer and science students. Mr. Rajesh Henry, Additional Excise Commissioner, GoMP attended the training programme for one day. As instructed by GoMP, the training programme was conducted in Hinds.

Prof. SV Patil, Technical Adviser & Head, Department of AT & B briefly explained to the participants regarding all departmental activities with special reference to the Mahuaproject.

The training programme covered different topics such as alcoholic & non-alcoholic beverages, Mahua tree & its importance, traditional vs scientific fermentations & distillation, analysis of total reducing sugar, ethanol& total organic volatile acidity, concept of sensory evaluation, isolation & maintenance of yeast culture, understanding pilot & effluent treatment plant, ideal packaging methods and rules & regulations linked to the Excise Department. The course also included hands-on practical based on the above topics which will be helpful for the participants while working at pilot demo plant at MP. During the training period, there was a one-day visit to

BrimaSagar Maharashtra Distilleries Ltd, Shreepur, Solapur, Maharashtra in which participants were acquainted about the Industrial pot distillation and foreign liquor.

On the occasion of the concluding session on January 28, 2022, the training certificates were given to the participants by Mr. Shivajirao Deshmukh, DG, VSI. He also briefed importance of this project about Mahua liquor. All the participants introduce their self and gave their positive feedback. During the session, discussion was also held and session was concluded with vote of thanks by Dr. S. Behera, Scientist, VSI.







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18/02/2022

Activity Name: Overview of Distilleries and Alcoholic Beverage Industry

Activity scope: The overview the different aspects of distillery and alcoholic beverage industry

Activity details:

Mr. Prasad Survey, Deputy Divisional Commissioner, Pune, State Excise, Government of Maharashtra State requested VSI to arrange half day training programme on 'Overview of distilleries and alcoholic beverage industry' for their 113 trainee officers. In this regard Department of Alcohol Technology & Biofuels (AT & B), VSI conducted half day training programme on 18th February 2022 for the trainee State Excise Officers, Government of Maharashtra. Mr. SR Jadhav, Deputy Superintendent, Hadapsar, Pune, Mr. Yuvraj Shinde, Deputy Superintendent, Pimpri Chinchwad and other few officers of training center Khandala were also present for the training programme. In the training Mr. DA Patil, Assistant Professor & Joint Technical Adviser, AT & B. elaborated the importance of the course to the participants. The first lecture was delivered by Mr. RV Godage, Assistant Professor & Joint Technical Adviser, AT & B. He has briefly presented his presentation on the topics such as Molasses quality, Storage of molasses, Batch fermentation, Continuous Overview of Distilleries and Alcoholic Beverage Industry fermentation, Atmospheric and Multipressure distillation, Characteristics of rectified spirit, Extra neutral alcohol, Fuel ethanol, Azeotropic distillation, Molecular sieve dehydration and DFPD Guidelines, Mr. DA Patil has presented his presentation on topics such as Role of Excise in distillery unit, Alcoholic fermentation process, Factors affecting on distillery performance, Atmospheric distillation process, Production process of country liquor, Indian made foreign liquor (Whisky, Brandy, Rum, Gin & Vodka), records and registers to be maintained in CL & IMFL, taxes and duties on molasses and alcohol . Dr. KS Konde, Associate Professor & Technical Adviser, AT & B, thanked to the Commissioner, State Excise, GoM and their Officers for sending their trainee officers for training. He has also taken the review of the lectures. In the concluding session of the training programme, Mr. Prasad Survey thanked to the management of VSI and concern staff of AT & B for giving valuable information about training to the trainee officers.

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VASANTDADA SUGAR INSTITUTE

VSI Bulletin: Vol. - 22, Issue - 1, January - March 2022



Overview of Distilleries and Alcoholic Beverage Industry

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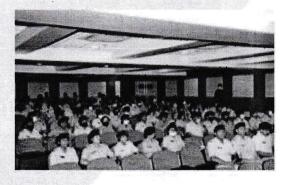
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Oos Sheti Dnyanyag & Dnyanlaxmi

In the memory of founder president of VSI late Padmabhushan Dr. Vasantdada Patil, *Oos Sheti Dnyanyag & Dnyanlaxmi* - residential training programmes were organized for sugarcane growers of Maharashtra at VSI in two batches during December 21 - 24 & 28 - 31, 2021 reported in previous issue of VSI Bulletin and remaining batches were conducted during January to March 2022 is reported in the present issue of VSI Bulletin. Details as given below;

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13/08/2021

Activity Name: Environmental Clearance, Compliances, Violations and Uploading of EC on Parivesh Portal

Activity scope: The make aware about Environmental Clearance, Compliances, Violations and Uploading of EC on Parivesh Portal

Activity details:

The Ministry of Environment Forests & Climate Change has taken steps to improve the environmental compliance process and also to bring transparency in this regard. As a part of this, its required that all the industries upload the information of their existing Environmental Clearance, Compliances, Violations and Uploading of EC on Parivesh Portal ECs online on Parivesh portal to help in the effective implementation of the EC condition. In order to help our member sugar mills in this aspect, the Department of Environmental Sciences organized an online workshop and demonstration under the auspices of "Aazaadi ka Amrut Mahotsav on 13th August 2021. This workshop was a joint effort of Maharashtra Federation of Cooperative Sugar Factories, Sugar Commissionerate, Government of Maharashtra & VSI. The workshop was attended by 95 participants. Mr. Sambhaji Kadupatil, OSD, VSI welcomed the participants in the beginning with an outline of the program. After this Mr. Shivajirao Deshmukh, Director General welcomed all participants and dignitaries. On the occasion of 'Azadi ka Amrut Mahotsav', he briefly covered evolution of sugar industry in India and particularly cooperative sugar sector in Maharashtra. Taking note of increase in the environmental issues in this industry, he urged the factory personnel to seriously look into it. Mr. Sanjay Khatal (MD, Maharashtra Federation of Cooperative Sugar Factories) picked up the same thread from DG, VSI and emphasized that global warming and climate change have become a major challenge for all of us. He expressed that sugar industry is now viewed as a bio-energy complex. Hence, the programme like this, which addresses environmental issues are immensely important. Towards end of his speech, he requested all participants to shift from 'chaltahai' (taken for granted) attitude and become serious on environmental issues.

Mr. Shekhar Gaikwad, Sugar Commissioner, in his speech, also emphasized on the pollution issue. In addition, he explained the role of sugar industry in Ethanol Blended Petrol (EBP) programme and economy of the state. He concluded his speech by giving best wishes to participants and organizers. Mr. Prakash Naiknavare (MD, National Federation of Cooperative Sugar Factories) joined the session as a participant. He expressed his eagerness to understand the present issue. This was followed by a presentation on 'Environmental Clearance Compliances and Violations' by Dr Deepali Nimbalkar where she explained the difference and the various notifications pertaining to the issue. She also talked about the special provisions for environmental clearance available for ethanol projects and the applicability of NIPL & B2 category.



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- Composition of cane and juice, principles of cane juice clarification with different types of liming and sulphitation process and tips to improve clarification efficiency.
- Role of Reducing sugar in sugar processing and various measures to reduce the final molasses purity.
- Pan Boiling: Theory of pan boiling, Tips to improve exhaustion in all grades massecuites
- Vertical and horizontal continuous pan and operational problems.
- Decanter and rotary vacuum filter
- Quality of sugar with reference to various test parameters, various types of sugars and liquid sugar.

- Intermediate boiling house products colour and their impact on final product
- Various measures to reduce the steam consumption in sugar mill
- Various measure to achieve best efficiency and sugar quality, during B Heavy diversion
- Molasses quality Total reducing sugar and Un-fermentable sugar
- Water management in sugar mills & recent trends in water management in sugar processing. Type of technologies for sugar condensate polishing units, ETP & STP Operation

Milling Plant

Department of Sugar Engineering, VSI conducted a one week duration tailor made short term training programme for Balarampur Chini Mills Ltd., groups Haidergarh Unit (UP) for engineering department heads, sectional heads and mill engineers of ten sugar mills on the 'Milling Plant' from 9th to 14th August 2021. Total 32 engineers participated in the training programme. Unit Head, Haidergarh unit, Corporate Technical Team Head (CTT Engineering) and HR officers, inaugurated the short-term training programme.

Mr. SP Nalawade Joint Technical Advisor and Mr. DN Shiotle conducted short-term training programme. In short term training different topics like cane handling, cane preparation, cane milling, mill gearing, hydraulic system, capacity and power calculations,

mill setting & trash plate profile. In addition to this, virtual training conducted on modern trends in juice extraction and power saving in milling plant by Mr. RA Chandgude-Technical Adviser & Head and Mr. PG Patil -Technical Adviser (Electrical).

The training programme also included practical calculations for sugar mill imbibitions, dilution ratio, juice drainage, mill capacity, power, mill setting and trash plate profile. The department heads of sugar units presented best practices adopted of their mills for repair and maintenance. They also, conducted the survey along with CTT Head along with participating engineers to Haidergarh plant and discussed on the mill performance, best practices in maintenance of milling plant.

Environmental Clearance, Compliances, Violations and Uploading of EC on Parivesh Portal

The Ministry of Environment Forests & Climate Change has taken steps to improve the environmental compliance process and also to bring transparency in this regard. As a part of this, its required that all the industries upload the information of their existing

ECs online on Parivesh portal to help in the effective implementation of the EC condition. In order to help our member sugar mills in this aspect, the Department of Environmental Sciences organized an online workshop and demonstration under the auspices of

10



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After the presentation, Dr. Vivek Patil and Mr. Kapil Uphade gave an online demonstration of registration of project on Parivesh portal of MoEFCC and uploading of the EC documents in the same. The EC documents of Vilas SSK were uploaded as a part of this demonstration.

There was active participation from the audience. They raised number of queries, followed by the demonstration. These queries were satisfactorily answered by staff of Dept of Environmental Sciences, as well as DG, VSI. The programme ended with vote of thanks proposed by Dr. Amol Deshmane.





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Manjari (Bk), Pune- 412307, Maharashtra

21/11/2021

Activity Name: She Is: 75 Indian women in STEAM

Activity scope: Women advancement for sustainable development goals in India

Activity details: The office of the Principal Scientific Advisor to the Government of India in partnership with Red Dot Foundation, British High Commission & FICCI FLO will commemorate India's 75th year of Independence by honoring 75 Indian women in STEAM (fields of Science, Technology, Engineering, Arts & Mathematics) through "She Is" book series. The aim of the book series is to showcase more women role models for youth, make visible the leadership of women.

Dr. Deepali Nimbalkar was a jury member for selection of 75 women in fields of Science Technology, Engineering, Arts & Mathematics to commemorate India's 75th year of Independence as a part of the book "She is: STEAM". The office of the Principal Scientific Adviser to Government of India made their announcement of final selection. She was also covered in the first edition of the book She is: Stories of women advancing the sustainable development goals in India. This is part of her contribution to women empowerment.

Participants: 75 Indian women with 8 Jury members

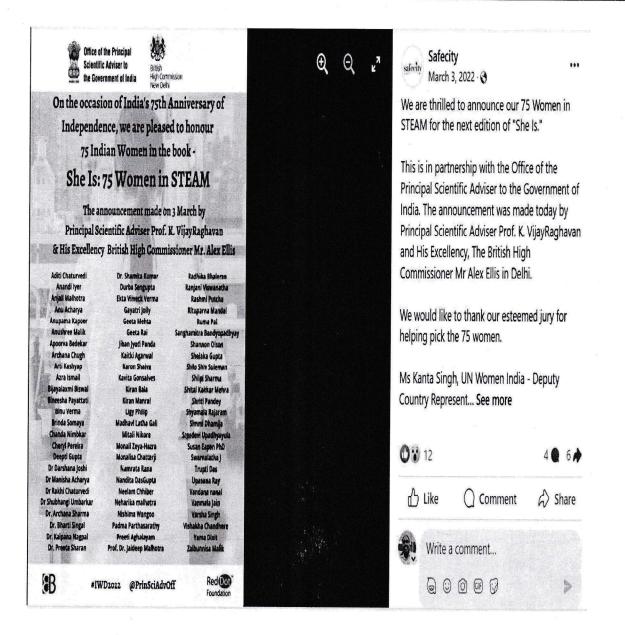
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