

# VSI

## BULLETIN



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### Foreword Foreword ...

As I present this bulletin of the third issue of this year, the farmers are very happy as monsoon season officially ended, with India recording 934.8 mm rainfall, 108 percent of the long-period average and the highest since 2020, according to India Meteorological Department data with this we hope that we will get bumper production in agriculture sector.

The Indian sugar market is projected to experience a slight decline in production for the 2024-25 season due to reduced sugarcane acreage. However, sufficient excess stocks and improved water availability are expected to support a balanced market. Exporters can expect a stable and productive season, with optimistic projections for overall market health.

The Department of Agriculture & Farmers' Welfare data showed that sugarcane sowing reached 57.68 lakh hectares this year, compared to 57.11 lakh hectares in the year 2023. Despite the reduced acreage, rainfall in the current year has been abundant, approximately 30% above average. The optimistic rainfall forecast for the remainder of the monsoon season is anticipated to enhance cane productivity and sugar recovery. This improved water availability is expected to mitigate the impact of the reduced cane area, resulting in only a minimal decline of 3-5 per cent in gross sugar production in Maharashtra and Karnataka.

Experts anticipate India's gross sugar production will be 34.5 million metric tonnes (MMT) and 4 MMT will go for ethanol production in the year 2024-25 seasons. However, ISMA projected opening stocks as of October 1, 2024, are estimated at 9.05 mt, with a gross sugar production of 33.3 mt. The total availability of sugar during the year is expected to be 42.35 mt, with domestic consumption estimated at 29.0 mt. By September 30, 2025, the closing stock is projected at 13.35 mt. These projections assume average rainfall and other optimal conditions for the remainder of the season.

Sugar Season-wise FRP announced by Central Government for ensuing sugar season 2024-25 has been fixed at Rs.340 per quintal linked to a basic recovery rate of 10.25% subject to a premium of Rs. 3.32 per quintal for each 0.1% increase of recovery over and above 10.25% and reduction in FRP at the same rate for each 0.1% decrease in the recovery rate till 9.5%. With a view to protect interest of farmers the Government has decided that there shall not be any deduction in case where recovery is below 9.5%; such farmers will get Rs. 315.10 per quintal for sugarcane.

A look at the events, training, workshops reported in this issue will once again showcase the prominent role of VSI in capacity building through training on the domestic front. Visitors to VSI also do not fail to be impressed by its functions in research, extension and training as VSI's work has always related to sugarcane growers and industry's needs by trying to reduce the gap between the lab and land.

(RM Devarumath)  
Editor

## EVENTS

### 78<sup>th</sup> Independence Day

VSI celebrated 78<sup>th</sup> Independence Day of India on August 15, 2024. National flag was hoisted by Mr. Sambhaji Kadupatil, DG at VSI campus in presence of Mr. Shivajirao Deshmukh, Advisor, Mr. DB Ghule, Registrar and staff members & students. On this

occasion, new classrooms inaugurated by Mr. Shivajirao Deshmukh, Mr. Sambhaji Kadupatil and Mr. DB Ghule and also gave awards to meritorious children of VSI employees for their excellent academic achievements.



## WORKSHOP WORKSHOP

### Use of VSI Inputs for Sustainable Sugarcane Farming

The one-day workshop on 'Use of VSI inputs for Sustainable Sugarcane Farming' was conducted on July 20, 2024 at Vasantdada Sugar Institute, Manjari, Pune. Dr. VK Kharche, Director of Research, Dr. Panjabrao Deshmukh Krishi Vidhyapeeth, Akola, was the chief guest and Dr. PS Bodake, Dean (F/A) and Director of Instructions, Dr BSKKV, Dapoli, Dr. Tukaram Mote, Joint Director, Extension, Ch. Sambhajinagar Division, Govt. of Maharashtra and Dr. AR Supate, Visiting Professor, IIT, Mumbai was the guest of honor. Dr. AD Kadalg, Principal Scientist (Crop Prod. & Prot., Agril. Section) Vasantdada Sugar Institute, Pune chaired the Inaugural function.

The invited guests Dr. VK Kharche, Dr. PS Bodake, Dr. Tukaram Mote, and Dr. AR Supate were felicitated and the proceedings of workshop were inaugurated by them. The guests distributed the agreements to the different agencies who signed agreement with VSI. Dr. TD Shitole, Scientist, Entomology section, VSI introduced the preface of the workshop. Total 278 participants attended the workshop out of which 233 were Krushi Seva Kendra/FPO representative, 35 were progressive farmers, 13 representatives from scientific institutes and 7 members of sugar factories from different regions of Maharashtra.

Dr. VK Kharche addressed the house and delivered the speech to the participants regarding use of agricultural inputs for maintaining the soil health and sustaining the sugarcane productivity.



Dr. PS Bodake explained the role and importance of nanoconjugates and experimental results conducted on different crops of coastal regions at Dr BSKKV, Dapoli.

Dr. Tukaram Mote, briefed about the rules, regulations and use of agricultural inputs. He emphasized how to reduce the use of chemical fertilizer by using organic manures, biofertilizers and other inputs of VSI.

Dr. AD Kadlag presented about the use of VSI inputs, their role in crop production and maintenance of soil health for sustainable agriculture production. He also mentioned about the packing, selling and discount scheme of VSI products.

The distributors from different districts of Maharashtra presented their views on VSI inputs regarding present scheme, input supply improvement, discount policy, regional/nearest distribution centre. The workshop was ended with vote of thanks

## Modern Technologies for Climate Resilience in Sugarcane Production

A one-day workshop on 'Modern technologies for climate resilience in sugarcane production' was organized by AS&T Division on August 30, 2024. Mr. PP Shinde, Scientist & Head, Agriculture Engineering Section welcomed Hon. Director General, speakers, Heads of Sections of AS&T Division and all the participants.

The workshop was inaugurated by Mr. Sambhaji Kadupatil, Director General VSI. In the inaugural speech, he highlighted the importance of the topic of the workshop. He briefed about importance of the climate resilient farming, integration of artificial intelligence in agriculture. Total 44 participants from 26 sugar mills attended this workshop.

During the technical session Dr. AD Kadlag, Principal Scientist, Crop Production & Protection delivered the lecture on 'Technologies for Cane Yield Maximization.' He nodded, sugarcane is a major industrial crop grown in tropical and subtropical regions worldwide, with a production value of 174 million tons. It is the most important cash crop in Maharashtra and requires high plant nutrients from the soil. Soil quality and biodiversity are essential for human life and agricultural development. However, soil health and productivity are declining due to climate change, leading to soil degradation in irrigated areas. Soil salinity and sodicity are major environmental concerns, affecting soil fertility and fertilizer use efficiency. Soil test-based fertilizer recommendations aim to improve soil and fertilizer nutrient

management, aiming for increased fertilizer use efficiency and environmental safety. Despite the potential of sugarcane, there is still room for improvement in sugarcane productivity through new technologies and improved management techniques.

Dr. JD Jadhav, Principal, ATS, Solapur had given a talk on 'Modern Technologies for Mitigation of Climate Resilience in Sugarcane Production'. He highlighted climate change poses significant challenges to sugarcane production, threatening yield and quality. To mitigate these impacts, modern technologies and practices are essential. Key technologies include precision irrigation, rainwater harvesting, and conservation practices. Genetic improvement, genetic engineering, precision agriculture technologies, and sustainable farming practices are also crucial. However, challenges like high initial costs, limited access to technology and capacity building remain. Despite these obstacles, collaboration among stakeholders, supportive policies, and continued research investment are necessary to drive innovation and adoption of climate-resilient practices. By embracing these technologies, the sugarcane industry can adapt to changing climate conditions and ensure sustainable production.

Dr. Shymal Virnodkar, Professor, KJSIT, Mumbai presented her talk on 'Introduction to Artificial Intelligence in Agriculture'. She told Artificial Intelligence (AI) is revolutionizing sugarcane farming by optimizing resource use, enhancing productivity,

and minimizing environmental impact. AI-driven crop monitoring, health assessment techniques, and AI-powered irrigation systems improve crop quality and reduce yield losses. AI's role in supply chain optimization enhances efficiency and profitability. Decision support systems provide data-driven recommendations, leading to higher yields and sustainable farming practices. As AI technology evolves, its application in sugarcane farming will expand, contributing to global food security.

The official representatives from Chatak Innovations Pvt. Ltd. were present during the workshop. They demonstrated the drone technology and briefed about the drone mechanism to all the participants.

The interactive session was held in presence of workshop coordinator. The participants raised their queries on various aspects of modern technologies and which were replied by concern expert. The program was concluded with a Following recommendations and vote of thanks by Dr. AS Patil, Scientific officer & I/C Head, Agronomy Section.

- Sugarcane varieties should be selected by considering the season and soil type for improving yield and sugar recovery as well as

to adopt the three tire seed production program for distribution of quality seed material in the operational area of sugar mill.

- The fertilizer recommendations should be based on limiting soil nutrient by considering major, secondary and micronutrients together.
- The preparation of soil fertility maps by using GIS is an effective tool for site specific nutrient management.
- Artificial Intelligence (AI) into sugarcane farming holds transformative potential, offering innovative solutions to the challenges faced by modern agriculture.
- Artificial Intelligence enables farmers to optimize resource use, enhancing productivity while, minimizing environmental impact. Advanced crop monitoring and health assessment techniques allow for early detection of diseases and pests, reducing yield losses and improving crop quality.
- Modern technologies like precision agriculture, genetic improvements, water management, and sustainable practices, needs to adapt in changing climate conditions for ensuring sustainable production.



## TRAINING

### *Oos Sheti Dnyanyag and Dnyanlaxmi*

In the reminiscence of founder president of VSI late Padmabhushan Dr. Vasantdada Patil, 'Oos Sheti Dnyanyag and Dnyanlaxmi' four days residential

training programs were organized for men and women sugarcane growers of Maharashtra at VSI, Pune during July 2-26, 2024 in 4 batches.

Batch No	Period	Area from which the farmers participated	No. of Participants	No. of sugar mills and individuals Participants
<b>Oos Sheti Dnyanyag programme (Men farmers)</b>				
I	July 2-5, 2024	Kolhapur and Sangli Districts	220	Sugar mills : 08 Individual : 01
II	July 9-12, 2024	Satara, Pune, Ahmednagar and Nashik Districts	207	Sugar mills : 09 Individual : 05
III	July 16-19, 2024	Solapur District and Marathwada region Individual: 07	223	Sugar mills : 09
<b>Oos Sheti Dnyanlaxi programme (Women farmers)</b>				
VI	July 23-26, 2024	All sugar mills in Maharashtra	122	Sugar mills : 08 Individual : 01
<b>Total participants (Women +Men)</b>			<b>772</b>	

In *Oos Sheti Dnyanyag* and *Dnyanlaxmi* training programs, 772 sugarcane farmers were participated from Jurisdiction of sugar mills in different parts of Maharashtra. Out of total sugarcane farmers, 14 sugarcane farmers were participated individually and rest of the farmers were deputed by 22 sugar mills from Maharashtra.

The training programs were conducted under valuable guidance of Mr. Sambhajirao Kadupatil, Director General & Dr. AD Kadlag, Principal Scientist, Crop Production and Crop Protection, VSI, Pune. Dr. GS Kotgire, Scientist, Plant Pathology Section has coordinated the program with the help of Scientist and supporting staff members of different disciplines of Agril Sciences & Technology Division.

Lectures on various topics related to sugarcane agriculture viz., varieties & varietal planning for

planting & harvesting, seed nursery management, tissue culture use, modern planting techniques, weed management, soil fertility and fertilizer management, irrigation water management, use of bio-fertilizers & bio-control agents, farm mechanization, economics of cultivation, ratoon management and integrated disease & pest management were conducted by Subject Matter Specialists. More emphasis was given on practicals and field demonstrations. The information on different types of Agril. inputs developed by VSI and academic activities of VSI was also given to them.

In the plenary session of every batch, the trainees cleared their doubts from the subject experts. The representative trainee farmers expressed their opinion about the training and hospitality. The certificates along with group photos were distributed to the trainees.

Batch No. : I



Batch No. : II



Batch No. : III



Batch No. : IV



## Short Term Training Programme

Keeping the knowledge of the workforce updated is a crucial part of Human Resource Development. VSI offers Short Term Training Programme (STTP) for employees of sugar mills to enhance their working knowledge vision to adopt new technology and also guide the industries to reform their normal function of sugar and allied industries. The training courses largely guides and assist the industries for skill development of staff. The workforce in the sugar

industry comprises of not only the person working in the mill but also the farmers in the cultivation in the sugar mill. VSI regularly conducts short term and refresher courses for sugarcane farmers and personnel working in the different section in the sugar mill and distilleries. The following STTPs are conducted by the Institute from June 24, to July 05, 2024.

Course Title	No. of Employees
Juice Clarification & Evaporation (Sugar Tech)	51
Pan Boiling & Centrifugal (Sugar Tech)	85
DFPD Guidelines for various feed stocks diversion for ethanol production & FRP Recovery calculation (Sugar Tech)	18
Special Analysis in Sugar Laboratory (Sugar Tech)	11
Boiler Attendant (Sugar Engineering)	22
Mill Foreman (Sugar Engineering)	28
Fermentation & Distillation techniques in distillery (Alcohol Tech)	22
Wet and Instrumental Analysis (Alcohol Tech)	05
Techniques in Analytical Instruments (Instrumentation)	05
Repairs & Maintenance of Sugar Factory Instruments.	22
Pollution Control and Environmental Management in Sugar Factories and distilleries (Environment Science)	04
ETP operation & maintenance (Environmental Sciences)	04
Laboratory Analysis of Waste Water & Solid waste (Environment Science)	03
<b>Total</b>	<b>280</b>



## Advanced Technologies in Sugarcane Agriculture

The residential training programme was organized for officers and staff members of Divisional Joint Director of Agriculture, Chh Sambhajinagar and Latur, sponsored by National Food Security Mission (NFSM). The objective of the training was to train the participant about advanced technologies in sugarcane agriculture. The two days training programme was conducted on September 25-26, 2024.

In all thirty participants viz. Agriculture Officers, Agriculture Assistants and Agriculture supervisors from Ch. Sambhajinagar (14) and Latur (16) were attended the training program.

The training was inaugurated by the Dr. AD Kadlag, Principal Scientist, Crop Production and Crop Protection. Dr. GS Kotgire., Scientist, Plant Pathology section welcomed all the participants and staff members.

Modern and scientific sugarcane cultivation technology was taught during the training period

which covered the lectures and practical's on various topics like sugarcane varieties and varietal planning, nursery management, tissue culture, modern planting techniques, soil fertility and fertilizer management, irrigation water management, use of bio-fertilizers, farm mechanization, ratoon management and integrated disease and pest management. All the agriculture scientists conducted theory lectures with the help of power point presentation. More emphasis on practical's and field demonstrations was given during the programme.

In the plenary session, the participants resolved their doubts from the subject experts. In the concluding function, the representative trainees expressed their satisfaction about the training and other facilities provided to them. Hon. Director General, VSI discussed with participants during farewell function and certificates were distributed to the trainees. The program concluded with the vote of thanks.

## VSI COMMITTEE MEETINGS

### VSI Committee Meetings

The Technical committee meeting of Technology section was held on July 20, 2024. The Governing Council meeting under the chairmanship of



Hon. President of VSI Mr. Sharad Pawar followed with Building and Purchase committee meeting was held on August 27, 2024 and in the month of September the investment committee meeting was held on September, 10, 2024.

The Technical Committee meetings were held under the chairmanship of Mr. Jayant Patil, Chairman and

other members comprising of Mr. Ashok Pawar, Mr. Bhairavnath B. Thombare, Dr. Indrajeet MohitePatil, Mr. Shivajirao Deshmukh, Adviser, VSI and Mr. Sambhaji Kadupatil, Director General, VSI were present. This meeting was conducted in two phased on June 22, 2024 and July 20, 2024. In this meeting, HODs across the departments of Sugar Engineering, Sugar Technology, Alcohol Technology & Biofuels, Environmental Science, and Electronics and Computer Science presented their review completed of R&D projects progress for the year 2023-24 and plan future research programs for 2024-25.



## VSI PARTICIPATION VSI PARTICIPATION

### 31<sup>st</sup> Meeting of the International Consortium for Sugarcane Biotechnology (ICSB)

Mr. Sambhaji Kadupatil, DG and Dr. RM Devarumath, Scientist, MB & GE Lab, Attended the 31<sup>st</sup> ICSB meeting at Hotel Residency tower, Coimbatore on July 07, 2024. Apart from this other members of ICSB as Cenicaña, Colombia-Fernando Silva, John Riascos (online), CTC, Brasil-Mike Butterfield, Brennan Hyden, CHACRA, Argentina-German Serino (Chair and Corresponding Secretary), CIRAD, France-Angelique D'Hont, Olivier Garsmeur, Simon Rio, CSIRO, Australia-Karen Aitken (online), EEAOC, Argentina-Francisca Perera, GMP,

Indonesia-RifkiBangsawan, EndahSusiyanti, ICAR-SBI, India-G Hemaprabha, C Appunu, SASRI, South Africa-Shailesh Joshi, Sandy Snyman, SRA, Australia-George Piperidis, NathaliePiperidis, SRI, Fiji-Amit Singh and WICSCBS, West Indies-Andrew Stoute, Sharon Wyatt were present.

In this meeting financial report, progress reports of the funded projects and upcoming new project proposal presentations and discussion was took place and meeting concluded with vote of thanks

### 13<sup>th</sup> Germplasm & Breeding and 10<sup>th</sup> Molecular Biology Workshop

Dr. RM Devarumath, Scientist, MB & GE Lab, attended the 13<sup>th</sup> Germplasm & Breeding and 10<sup>th</sup> Molecular Biology International Workshop at the Residency Towers, Coimbatore, from July 8-12, 2024 organized by International Society of Sugar Cane Technologists (ISSCT), ICAR- Sugarcane Breeding Institute, Coimbatore and Society for Sugarcane Research and development. In the workshop various lectures of researchers (oral/posters) from National and International speakers

presented their work on sugarcane in the subject of breeding, biotechnology and Germplasm utilization for development of climate-smart and resources-efficient sugarcane varieties. During the workshop, visit program was arranged to see ICAR-SBI facility, field plots and Labs and also visited to National Distant Hybridization Facility, Agali, Kerala. The conference concluded on July 12, 2024.

### 82<sup>nd</sup> Annual Convention of STAI at Jaipur

The 82<sup>nd</sup> Annual Convention of the Sugar Technologists' Association of India (STAI) was held on July 30-31, 2024, in Jaipur, Rajasthan. On this occasion, a distinguished panel of guests graced the inaugural session by Mr. Shivajirao Deshmukh, Hon'ble Adviser, Vasantdada Sugar Institute, Pune, was the Chief Guest; Mr. Sanjay Awasthi, President, STAI; Mr. Shambhaji Kadupatil, Director General, VSI, Pune; Dr. R Viswanathan, Director, ICSR, Lucknow; Mr. Kunal Yadav, Managing Director, Yadu Sugar; Dr. Seema Paroha, Director, NSI, Kanpur; Mr. Sangamesh Nirani, Executive Director, MRN Group; Mr. MV Joshi, Managing Director, KA Jawahar SSK Ltd,

Hupari; and Mr. M. Chinnappan, President, SISSTA, were also present.

Mr. Shivajirao Deshmukh, the Chief Guest, addressed the sustainability of the sugar industry and the latest industry trends. The session also honored notable contributions with the lifetime achievement award presented to Mr. Shambhajirao Kadupatil, Director General, VSI, Pune, and Mr. JR Dandegaonkar, Trustee, VSI, Pune.

SN Gundurao Memorial Lecture focusing on industry sustainability and contemporary challenges as part

of the convention chaired by Mr. Shivajirao Deshmukh, Advisor, VSI

On the second day, the convention featured a total of sixty-six papers across various segments, including factory engineering, factory processing, co-products, and sugarcane agriculture. VSI's Mr. RA Chandgude, Head & Technical Adviser, Sugar Engineering Department, and Mr. N Mahana, Senior Sugar Technologist, Sugar Technology Department, co-chaired Factory Engineering and Processing sessions respectively.

Key papers presented by VSI scientists as in the Factory Processing session, 'Refined Pan Automation: An Experience in the Middle East' by Mr. N Mahana; in the Co-Products session, 'Opportunities of Compressed Biogas (CBG) Production in the Sugar Industry and Distillery' by Dr. KS Konde; and 'Microbial Gluconic Acid Production: A Value Addition to the Sugar Industry' by Dr. S Behera and in the Sugarcane Agriculture session, 'Effect of Consortium of Halophilic and Halotolerant Microorganisms on Reclamation of Saline Sodic Soil' by Mrs. SD Ghodke.



## 53<sup>rd</sup> Annual Convention of SISSTA at Bengaluru

VSI team of scientist consisting of Dr. JM Repale, Plant Breeding Section, Dr. GS Kotgire, Plant Pathology Section Mr. N Mahana, Mr. K. Gangadharam from Sugar Technology Dept., Mr. MV Taur, Mr. AP Dhage from Sugar Engg. Dept. and Dr. Sangram Patil from Alcohol Technology & Biofuels participated in the 53<sup>rd</sup> SISSTA Annual Convention held on August 19-20, 2024 at Bengaluru.

Mr. Narayan Mahana, Sr. Sugar Technologist, Sugar Technology Department received Shri Mydur Anand Gold Medal for Best paper in Process entitled 'Possibilities of Carbonation sugar Refinery in Indian sugar industry'. Mr. K. Gangadharam co-chaired the process section. The details of the research papers presented and discussed by the participated scientists details given in the table.

S.No.	Title of the technical papers	Name of the presenting author
	<b>Agriculture</b>	
1	Assessment of newly developed sugarcane genotypes for yield and quality traits at VSI, Pune	DR. JM Repale
2	Management of brown spot disease in sugarcane	Dr. GS Kotgire
	<b>Process</b>	
3	Technical hurdles to set up standalone sugar refinery in Indian sugar industry.	Mr. N Mahana
4	Challenges and Remedies in Sugar processing during implementation of various Encon measures.	Mr. K Gangadharam
	<b>Engineering and Co-gen</b>	
5	Effect of ethanol blending on diesel engine performance and emissions	Mr. MV Taur
6	A case study of the roller chain strength and reliability of sugarcane mill conveying systems	Mr. AP Dhage
	<b>By-products</b>	
7	Prospects of wax recovery from press mud cake for sugar industry	Dr. Sangram Patil

## Visit to Danfoss – Finland

Mr. RA Chandgude, Technical Adviser & Head and Mr. PG Patil, Technical Adviser, Sugar Engineering Department, VSI, Pune, visited Danfoss Drives in Finland during September 09-11, 2024. They attended a technical meeting with Mr. KajRolander, Product Owner, Mr. Juha Holster, Product Marketing

Manager, Mr. Jaakko Honkaranta, Senior Reliability Test Engineer, Ms. Anna Hakkari, Communications Specialist, and Mr. Jonas Forsberg, Product Owner. They also visited to the manufacturing plant and observed the testing, manufacturing and quality control facilities.



## 8<sup>th</sup> IAPSIT International Sugar Conference Sugarcon 2024 & Sugar Expo

8<sup>th</sup> IAPSIT International Sugar Conference Sugarcon 2024 & Sugar Expo conducted at ICISE, Quy Nhon, Vietnam during September 16-19, 2024. On this occasion, Mr. Shivajirao Deshmukh, Advisor, Vasantdada Sugar Institute, Pune, India received an award for Leadership & excellence in sugarcane R & D.

Mr. Sambhaji Kadupatil, Director General, Vasantdada Sugar Institute, Pune, India received an award for his outstanding leadership in Sugar Industry Research and Dr. RV Dani, Technical Adviser & Head, Sugar Technology Department, received an award for his outstanding contribution in the field of excellence in R & D work for sugar Industry. Besides this,

Dr RV Dani, Mr. RA Chandgude, Dr. KS Konde, Mr. PP Shinde, Dr. SG Dalvi, Dr. Preeti Deshmukh, Mrs. Sudha Ghodke had given the oral presentation on research in respective discipline in this conference. Details of the technical Papers as given below; Dr. AD Kadlag and Mr. AA Prabhavalkar also attended this conference. Mr. Shivajirao Deshmukh, Pune was the chief guest for the Valedictory Function of this International conference.

- 'Geostatistical modeling for spatial variability assessment of soil fertility in sugarcane growing soils of Jalna District, Maharashtra, India' by Dr. Preeti Deshmukh
- 'Efficient water management through micro-irrigation systems in sugarcane' by Mr. PP Shinde.

- 'Advancing nutrient economy and increasing sugarcane yield by the application of a consortium of beneficial soil microorganisms and consortium endophytic nitrogen-fixing bacteria' by Mrs. Sudha D. Ghodke
- 'Sugar industry- sustainability through cost curtailment' by Dr. RV Dani
- 'Green hydrogen: A sustainable opportunity for the sugar & distillery industry' by Dr. KS Konde
- 'Unlocking agricultural potential: gamma radiation and natural polymers in climate change mitigation and crop fortification' by Dr. Sunil Dalvi
- 'Consequence of ethanol blending in diesel engine: A strategic analysis of performance and emission' by Mr. RA Chandgude



## The 69<sup>th</sup> Annual Convention of Deccan Sugar Technologists' Association (DSTA)

The 69<sup>th</sup> Annual Convention of DSTA was held at Hotel JW Marriott, Pune on August 24-25, 2024. Dr. RV Dani, HOD & Technical Adviser and Mr. Narayan Mahana, Sr. Sugar Technologist Sugar Technology Department attended the seminar.

In this convention Dr. RV Dani conferred with Chandrashekhar Agashe First Prize in Manufacturing Section for last year technical paper 'VVHP raw sugar for Direct Consumption' and Mr. Narayan Mahana presented paper on 'Success story in achieving 32% steam from 42% in an old plant- A case study'.



## Boiler India 2024

Mr. RA Chandgude, Technical Advisor & Head of the Sugar Engineering Department at VSI, Pune, delivered a keynote speech at the conference 'Boiler India 2024' was organized by the Directorate of Steam Boilers, Labour Department, Government of Maharashtra from September 25-27, 2024 at CIDCO Exhibition Centre, Vashi, Navi Mumbai. The event was organized for Boiler Users, Boiler Manufacturers, and Skill Development.

Mr. RA Chandgude gave presentation on 'Major challenges in the operation and maintenance of boilers in sugar industries and their remedial measures'. He covered topics like, including optimal function and desired performance, efficient operation and standard maintenance practices, challenges faced by boilers, breakdowns and maintenance, specific corrective measures, water treatment and scaling, standard repairs/maintenance as per IBR, as well as strategies for efficient operation for sustainable steam and power generation.



## VISITORS TO VSI

Praj team visited Vasantdada Sugar Institute (VSI), Pune on dated July 4, 2024 & signed MoU with Vasantdada Sugar Institute, Pune to establish a Centre of Excellence (CoE) at VSI. From Praj side, Dr. Pramod Chaudhari, Founder Chairman, Praj Industries Ltd., Mr. Atul Mulay, President and Strategic Business Unit Head for Bio Energy Division, were present in the meeting. From VSI side, Mr. Sambhaji Kadupatil, Director General,



Mr. Shivajirao Deshmukh, Advisor, Dr. KS Konde, Head, Professor & Technical Adviser, Department of Alcohol Technology & Biofuels were present in the meeting. The prime objective of the CoE is based on to develop biobased products with lower carbon footprints by using sugarcane & alternate feedstocks. Different collaborative project work between Praj & VSI will be carried out for the development & evaluation of next generation farm to fuel integration.

Dr. V L Amolic, Head of the Department of Botany, Mahatma Phule Krishi Vidyapeeth, Rahuri, visited Institute on August 1, 2024. His visit was warmly welcomed by Dr. AD Kadlag, Principal Scientist (Crop Production and Protection), who introduced him to various ongoing research activities at the institute.

During his visit, Dr. Amolic engaged in a productive discussion with Mr. Sambhaji Kadupatil, Director General of the institute, about the progress of collaborative research projects. The focus was on the Multilocation Trials (MLT), a significant collaborative effort involving selected genotypes developed by the Central Sugarcane Research Station,



Padegaon, and Vasantdada Sugar Institute, Pune and further release of new sugarcane varieties.

Dr. Amolic also visited fields of selection trials of promising genotypes. He inspected a few plots and provided valuable insights for future research projects and he guided them on selection criteria and advanced breeding techniques which is beneficial to the Scientists from Plant Breeding section. Apart from this he also visited other sections like Tissue Culture, Soil Science, and Agricultural Microbiology laboratories. He had in-depth discussions with the Scientists working in these labs, further strengthening the collaborative efforts between Mahatma Phule Krishi Vidyapeeth and VSI.

Dr. SA Shinde, Ex Head, Department of Agriculture Extension & Communication, MPKV, Rahuri and Dr. AV Patil, Scientist, Agriculture College, Shivajinagar, MPKVR Rahuri visited VSI on August 2, 2024. During their visit Dr. AV Patil gave lecture on 'Antioxidant Mechanism and Osmotic Accumulation in Sugarcane under Sodic Soils' and

Dr. SA Shinde gave lecture on 'Communication Skills of Marketing'. On the occasion all the Head of the section, scientist and technical staff of Agriculture Science and Technology Department were present. Later they visited some of the sections to know the research programs of AS & T Divisions.

Dr. TP. Saikia, Chief Scientist and Dr. TK Borbora, Jr. Scientist (plant Breeding) from Sugarcane, Medicinal and Aromatic Plants Research Station, Buralikson, Assam Agricultural University visited VSI during August 20-24, 2024. Their visit was warmly welcomed by Dr. AD Kadlag, Principal Scientist (Crop Production and Protection), who introduced them to various ongoing research activities at the institute.

During visit, Scientists had a discussion with Mr. Sambhaji Kadupatil, Director General, about the areas of collaborative research projects. Later the Scientists had a meeting with the Heads of Sections from the Agricultural Sciences and Technology Division under Chairmanship of Dr. A. D. Kadlag, Principal Scientist (Crop Production and Protection). During the meeting, following important decisions and areas of research were finalized.

- The seed material of the released and promising genotypes from Assam and seed of a few *Saccharum Officinarum* types available will be spared to the institute for germplasm maintained at Amboli during the month of January, 2025.

- The institute will supply the TC seedlings of the sugarcane varieties from Assam as per their demand
- The institute will provide various sugarcane production technologies for sugarcane production in Assam State and help for testing the VSI's product.

- The sight specific nutrient management and development of STCR based targeted yield equation for Assam State will be done in Collaboration.

- The collaborative project in microbiology focusing on Integrated Nutrient Management (INM) and Integrated Pest

Management (IPM) with an emphasis on isolating local strains to enhance use efficiency to be undertaken.

The scientists visited the Naigaon and Lonarwadi farms of the institute and also visited all the sections of AS&T and discussions with the Scientists working in these labs. They also visited Shree Datta Shetkari SSK Ltd. sugar mill in Shirol, Kolhapur and gathered detailed information about the drainage project implemented by the sugar mill. The cane growers from Ghalwad village shared their experiences, highlighting the various benefits they have observed from the operation of the drainage project.





Dr. Vijay Suryawanshi, (IAS) Commissioner of State Excise, Government of Maharashtra, Mr. Sagar Dhomkar, Divisional Deputy Commissioner of Excise, Pune and Mr. CB Rajput, Superintendent of Police, Pune visited to Vasantdada Sugar Institute, Pune on September 2, 2024. During the visit Commissioner State Excise and their Officers visited to Department of Alcohol Technology & Biofuels along with Mr. Sambhaji Kadupatil, Director General,



Dr. KS Konde, Head, Professor & Technical Adviser, Department of Alcohol Technology & Biofuels explained the details about work carried out by the department for Distillery & Allied Industry like analysis of Molasses, Grains to ethanol, Denaturants, Liquors and ethanol. They also visited facilities of pilot winery and nano brewery laboratories and other departments like Tissue Culture and Microbiology sections.

### Following Visitors were visited VSI during (July, August & September, 2024)

Name of Institutions	Visitors	Total
<b>July - 2024</b>		
Department of Biotechnologies, Dharwad University, Karnatka	Students and Faculties	42
Individual Farmers from Maharashtra State	Farmers	536
<b>August- 2024</b>		
Dr. Sharadchandra Pawar College of Agriculture, Baramati, Dist: Pune	Students	20
Department of Agriculture from Bailhongal, Dist: Belgavi	Farmers and Officer	51
College of Agricultural Biotechnology, Pokharni Dist: Nanded	Students and Faculties	43
Sighgad Institute of Technology, Lonavale, Dist: Pune	Students	4
Sai Krupa College of Agriculture, Ghargaon, Tal: Shrigonda, Dist: Ahmednagar	Students(RAWE)	6
Individual Farmers from Maharashtra State	Farmers	475
<b>September - 2024</b>		
Shree Madhi Vibhag Khand Udog Mandali, Madhi Dist : Surat , State Gujrat	Farmers	50
D.Y.Patil College of Engineering & Technology Kolhapur	Student	1
MGM College of Agriculture Biotechnology, Gandheli, Chh. Sambhajinagar	Students and Lecturers	52
Sanjivani Arts, Commerce and Science College, At: Sahajandnagar, Post : Shignapur, Tal: Kopargaon, Dist: Ahmednagar	Students and Faculties	44
College of Agricultural Biotechnology, Vidynagari, Baramati, Dist : Pune	Students and Faculties	26
Dindayal Research Institute KVK Digholamba, Ambajogai, Beed - 1	Farmers	8
Association of Future Agriculture Leaders of India, (FALI), Tal : Maval , Dist: Pune	Students and Teachers	247
Shri Prabhulingeshwar Sugars and Chemicals, Tal: Jamkhandi, Dist: Bagalkote, State: Karnataka	Farmers and Officers	93
Individual Farmers from Maharashtra State	Farmers	407
<b>Total</b>		<b>2105</b>

## पावसाळा हंगामात ऊस पिकावर आढळणारे रोग व उपाय

गणेश कोटगिरे आणि ए.डी. कडलग  
ऊसरोग शास्त्र विभाग

वसंतदादा शुगर इन्स्टिट्यूट, मांजरी बु.॥, पुणे

ऊस हे भारतातील महत्वाचे नगदी पीक असून ते अनेक राज्यात लागवडीखाली आहे. या पिकाखालील क्षेत्रातदेखीत सातत्याने वाढ होतेय, परंतू देशात ऊस पिकाचे दरमहा दरहेक्टरी उत्पादन मात्र अपेक्षेपेक्षा खूपच कमी म्हणजे मागील गळीत हंगामात ते ७५ मे.टन. इतके होते. महाराष्ट्रात मात्र ऊस उत्पादकता हेक्टरी ८५ मे.टन. इतकी होती. ऊसाचे व साखरेचे प्रति हेक्टरी उत्पादन कमी येण्याची अनेक कारणे आहेत. या कारणांपैकी ऊस पिकावर होणाऱ्या रोगांचा प्रादुर्भाव व त्यांचा वाढता प्रसार हे एक महत्वाचे कारण आहे. महाराष्ट्रात आजपर्यंत ३० रोग ऊस पिकावर आढळलेले आहेत. पिक संरक्षणाबाबत शेतकऱ्यांचे अज्ञान व त्यांना मिळणारी अपुरी माहिती, रोग नियंत्रणाबाबत शेतकऱ्यांची उदासिनता, शिफारशीत नसलेल्या ऊस जातींची लागवड, हवामानातील बदल, सेंद्रिय, रासायनिक आणि जैविक खतांचा असंतुलित व अवेळी वापर, पाण्याचा कमी किंवा अधिक प्रमाणात वापर, राज्यातील दुष्काळी चक्र, किडींचा वाढता प्रसार व प्रादुर्भाव या अशा विविध घटकांमुळे रोगाच्या वाढीस व प्रसारास योग्य वातावरणनिर्मिती तयार होवून रोगांचा प्रसार आणि प्रादुर्भाव वाढत आहे.

पावसाळा हंगाम चालू असतांना हवेत सापेक्ष आर्द्रतेचे प्रमाण जास्त असते, शेतात पाणी साचून मुळांची कार्यक्षमता घटलेली असते तसेच हलक्या, वालुकायुक्त, मुरमाड जमिनीतून पिकास आवश्यक असणाऱ्या अन्नद्रव्यांचा निचरा होतो किंवा ती पाण्याद्वारे वाहून जातात; यामुळे पिकाचे पोषण व्यवस्थित होत नाही. पिक अशक्त बनते. अश्या परिस्थितीत ऊस पिकामध्ये अनेक रोगांचा प्रादुर्भाव होतो, त्यांचा जोर वाढतो तसेच त्यांचा प्रसारदेखील जास्त होतो. पावसाळा हंगामात तसेच पावसाळ्यानंतर ऊस पिकाच्या पानांवर हवेद्वारे पसरणारे तपकिरी तांबेरा, पोक्का बोंग, तपकिरी ठिपके, आय स्पॉट (नयनाकृती दिसणारे ठिपके), झोनेट स्पॉट आणि जमिनीतून पसरणारे मर, कांडीकुज आणि मुळकुज हे रोग प्रामुख्याने आढळतात. यापैकी काही रोगाबाबत सविस्तर माहिती या लेखात देत आहोत.

### पोक्का बोंग

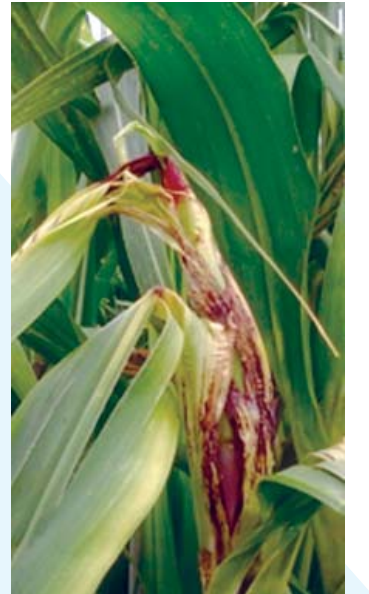
पोक्का बोंग हा रोग फुजॅरियम मोनिलीफॉरमी/सॅकाराय या हवेद्वारे पसरणाऱ्या बुरशीमुळे होतो. को ४९९, कोसी ६७९, व्हीएसआय

४३४, को ८६०३२, एमएस १०००९ आणि कोव्हीएसआम ९८०५ या ऊस जाती या रोगास बळी पडतात. महाराष्ट्राच्या सर्व हवामान विभागात या रोगाचा प्रादुर्भाव ऊस पिकांवर आढळतो. दक्षिण महाराष्ट्रात मात्र जास्त पाऊस पडणाऱ्या भागात आर्द्रतेचे प्रमाण हवेत जास्त काळ राहिल्याने या रोगाचे प्रमाण जास्त आहे. पावसाळा हंगामापूर्वी वळीव स्वरूपाचा पाऊस झाल्यांवर रोगाचा प्रादुर्भाव ऊसाच्या पोग्यात किंवा कोवळ्या पानांवर दिसून येतो.

पोक्का बोंग रोगाची लक्षणे : पोक्का बोंग रोगामुळे अनेक प्रकारची लक्षणे उसाच्या पानांवर आणि कांड्यावरती नोंदविण्यात आलेली आहेत . बुरशीची लागण झाल्यांवर सुरवातीस तिसऱ्या व चौथ्या पानांच्या बेचक्यात (पानाच्या व देठाच्या जोडाच्या ठिकाणी) पांढरट-पिवळसर पट्टे दिसून येतात. लागण झालेल्या पानांवर सुरकुत्या पडून पाने आकसतात तसेच त्यांची लांबी घटते. रोगाची तीव्रता वाढते त्यावेळी पाने सडतात/कुजतात व नंतर गळून पडतात किंवा एकमेकांत गुरफटतात. कधी कधी रोगाची तीव्रता वाढल्यामुळे पोंगा मर किंवा शेंडा कुज दिसून येते. काही वेळेस रोगग्रस्त ऊसाच्या कांड्यांवर कांडी काप (नाइफ कट) सारखी लक्षणे दिसून येतात. रोगाचा प्राथमिक प्रसार हवेमार्फत, तर दुय्यम प्रसार पाणी, पाऊस व कितकाद्वारे होतो.



पाने एकमेकात गुरफटणे



पाने सडणे किंवा कुजणे



कांडी काप (नाइफ कट)

### पोक्का बोंग रोग निमंत्रणाचे उपाय :

- रोग लागण झालेल्या शेतातील शेंडेकुज झालेले व पांगशा फुटलेले ऊस शेतातून वेगळे काढावेत व जाळून नष्ट करावेत व नंतर रोगाच्या नियंत्रणाकरिता ०.२ टक्के कॉपर ऑक्झिक्लोराईड (१ लिटर पाण्यात २ ग्रॅम बुरशीनाशक) किंवा ०.१ टक्के बावीस्टीन (१ लिटर पाण्यात १ ग्रॅम) किंवा ०.३ टक्के मॅकोझेब (१ लिटर पाण्यात ३ ग्रॅम डामथेन एम ४५) यापैकी एका बुरशीनाशकांच्या १० दिवसांच्या अंतराने स्टीकर वापरून २ ते ३ फवारण्या कराव्यात.
- पिकास खतांची मात्रा माती परिक्षणानुसार योग्य प्रमाणात योग्य वेळी द्यावी.

### तपकिरी तांबेरा

तपकिरी तांबेरा हा रोग पुकसिनीमा मॅलॅनोसिफॅला या हवेद्वारे पसरणाऱ्या बुरशीमुळे होतो. तांबेरा रोगामुळे ऊस पिकाचे ४० टक्केपर्यंत नुकसान होवू शकते. को ४१९, कोसी ६७१, कोव्हीएसआय ९८०५, को ९२००५, एमएस १०००१, व्हीएसआय४३४ आणि कोएम ०२६५ या ऊस जाती रोगास जास्त बळी पडतात; तर अलिकडे को ८६०३२ या ऊस जातीवर देखील या रोगाचा प्रादुर्भाव दिसत आहे. स्फुरद व पालाश जास्त असणाऱ्या जमिनीत घेतलेल्या उसपिकात रोगाची तिव्रता जास्त आढळून येते. पावसाळा हंगामात हवेत वाढणारी आर्द्रता आणि तापमान या रोगाच्या बुरशीच्या वाढीसाठी आणि प्रसारासाठी पोषक असते.

तपकिरी तांबेरा रोगाची लक्षणे: रोगाची लागण झाल्यावर सुरुवातीस पानांवर लहान व लांबट पिवळे ठिपके पानाच्या खालच्या बाजूस

दिसून येतात. कालांतराने ठिपक्यांची लांबी वाढते व त्यांचा रंग लालसर तपकिरी किंवा तपकिरी दिसून येतो. ठिपक्यांचा भाग बुरशीच्या आणि बिजाणूच्या वाढीमुळे फुगीर होतो. त्यामुळे पानांचा ठिपक्यालगत भाग फुटून त्यातून नारिंगी किंवा तांबूस-तपकिरी रंगाचे बिजाणू बाहेर पडतात. रोगग्रस्त पानाच्या पाठीमागच्या पृष्ठभागावरून बोट फिरविले असता बिजाणूची पावडर सहजपणे बोटस चिकटते. तांबेरा रोगाचा प्रादुर्भाव व प्रसार पावसाळ्यानंतर ढगाळ वातावरण, जास्त आर्द्रता व थंड हवा असताना जास्त प्रमाणात दिसून येतो. रोगाचा प्रसार हवा, पाणी, पाऊस व किटकांद्वारे होतो.



पानावर तांबेरा रोगाची लक्षणे

### तांबेरा रोग नियंत्रणाचे उपाय:

रोगाचा प्रादुर्भाव जास्त येणाऱ्या भागात मध्यम रोगप्रतिकारक जातींची (कोव्हीएसआय ०३१०२, व्हीएसआय ०८००५) लागण करावी.

पिकास खतांची मात्रा माती परिक्षणानुसार योग्य वेळी द्यावी. नत्रमुक्त खताचा तसेच इतर खतांची मात्रा उशिरा देऊ नये. पावसाळ्यात शेतातून अतिरिक्त पाण्याचा निचरा

करावा.

तांबेरा रोग दिसून आल्यावर लगेचच ०.२५ टक्के प्रमाणात प्रोपिनेब (उदा. अँट्राकॉल, १ लिटर पाण्यात २.५ ग्रॅम बुरशीनाशक) किंवा ०.३ टक्के प्रमाणात मॅकोझेब (उदा. डामथेन एम ४५, १ लिटर पाण्यात ३ ग्रॅम बुरशीनाशक) या बुरशीनाशकाच्या १० दिवसांच्या अंतराने स्टीकर वापरून २ ते ३ फवारण्या कराव्यात. रोगाचा जास्त प्रादुर्भाव असेल तर फवारणीपुर्वी रोगग्रस्त आणि वाळलेली पाने शेताबाहेर काढावीत.

### गवताळ वाढ

गवताळ वाढ हा रोग बेण्याद्वारे व किडीद्वारे पसरणाऱ्या फायटोप्लाझ्मा या अतिसूक्ष्म विषाणूमुळे होतो. को ४१९, कोसी ६७१, कोएम ०२६५ व को ८६०३२ या जातीत या रोगाचे प्रमाण जास्त आढळते. महाराष्ट्रात या रोगाचे प्रमाण १०% पर्यंत आहे. पीक वाढीच्या सर्व अवस्थेत या रोगाचा प्रादुर्भाव आढळतो. या रोगाचा प्रसार मुख्यत्वेकरून दुषित बेण्यामार्फत व किडीद्वारे होतो.

रोगामुळे पिकाच्या सुरुवातीच्या काळात ऊस बेटात प्रमाणापेक्षा जास्त फुटवे दिसतात व बेटास गवताच्या ठोंबाचे स्वरूप येते. बेटांत फुटव्यांची संख्या कधी-कधी १०० पेक्षा जास्त आढळते. रोगामुळे उसाच्या पानामध्ये हरितद्रव्य कमी प्रमाणात तयार होत असलेने पाने पिवळी किंवा पांढरी पडतात. रोगट बेटात गाळण्यालायक ऊस तयार होत नाहीत. रोगट उसावरील पाने अरुंद व आखूड होतात. पूर्ण वाढ झालेल्या उसास रोगाचा प्रादुर्भाव झाल्यास, पोंग्यातील पाने पिवळी पडतात व कांड्यावरील डोळ्यातून पिवळसर पांगशा फुटतात. रोगट ऊस नंतर पोकळ पडतो व वाळतो. गवताळ वाढ रोगामुळे ५ ते २०% पर्यंत ऊस उत्पादनात घट येते. खोडवा पिकात रोगामुळे जास्त प्रमाणात बेटे पिवळी पडतात व मरतात. रोगाचे प्रमाणदेखील सुरुवातीच्या काळात जास्त आढळते. रोगग्रस्त खोडवा पिकातील उसांची संख्या घटते.



### गवताळ वाढ रोग नियंत्रणासाठी

- बेणेमळ्यातील बेणे लागणीसाठी निवडावे. बेणेमळ्यासाठी मुलभूत बेणे तयार करण्यासाठी लागवडीपूर्वी ऊस बेण्यास बाष्प उष्ण हवा प्रक्रिया ५४ सें.ग्रे. तपमानास १५० मिनीटे करावी.
- उसाची उगवण झालेनंतर नियमितपणे ऊस पिकाची पाहणी करून रोगट बेटे मुळासहित काढावीत व जाळून नष्ट करावीत.
- सामुहिक पद्धतीने बेटे निर्मुलनाचा कार्यक्रम हाती घेतल्यास रोगाचे निमंत्रण प्रभावीपणे करता येईल.
- बेणे छोटते वेळी कोयता अधून मधून उकळत्या पाण्यात बुडवावा.
- उसावरील रस शोषण करणाऱ्या कीडींचा बंदोबस्त वेळीच करावा; जेणेकरून रोगाचा प्रसार होणार नाही.
- रोगाचे प्रमाण २०% यापेक्षा जास्त असल्यास त्या पिकाचा खोडवा घेवू नये. पिकाची फेरपालट करावी, जेणेकरून या रोगाचे प्रमाण पुढील पिकात कमी राहील.

येलो लीफ डिसीज

मागील ४ ते ५ वर्षांपासून महाराष्ट्रात लागवडीखाली असलेल्या को ८६०३२ या प्रमुख ऊस जातीवर तसेच इतर रूंद पाने असणाऱ्या

जातीमध्ये येलो लीफ डिसीज या रोगाचा प्रादुर्भाव व प्रसार झपाट्याने पसरत आहे. इतरत्र या रोगामुळे उसाचे उत्पादनात ३० ते ५० टक्के उत्पादन घटल्याची उदाहरणे आहेत. लागण पिकापेक्षा खोडवा पिकात या रोगाचे प्रमाण जास्त आढळते.

ऊस पिकाचा पाने पिवळी पडणारा रोग प्रथम हवाई बेटांवर सन १९८८ मध्ये आढळला. परंतू, सध्या हा रोग जगभरातील अनेक देशात ऊस पिकांवर कमी अधिक प्रमाणात ऊस पिकावर आढळत आहे. उसावरील यलो लीफ डिसीज हा पूर्वी यलो लीफ सिंड्रोम या नावाने ओळखला जात होता. या रोगाने ब्राझीलमध्ये १९९० साली फार मोठे नुकसान एस.पी. ७१६१६३ या जातीचे झाले. महाराष्ट्रात लागवडीखाली असलेल्या को ८६०३२ या व्यापारी लागवडीखाली असलेल्या प्रमुख ऊस जातीवर या रोगाचा प्रादुर्भाव दिसलेला आहे. आणि या रोगाचा प्रसार झपाट्याने पसरत आहे. या रोगामुळे उसाचे उत्पादनात ३० ते ५० टक्के उत्पादन घटल्याची उदाहरणे आहेत. लागण पिकापेक्षा खोडवा पिकात या रोगाचे प्रमाण जास्त आढळते.

### रोगाची लक्षणे

या रोगाची लक्षणे पिकाचे वय पाच ते सहा महिन्याचे असताना दिसू लागतात. रोगाची लागण प्रथम शेंड्याकडील तीन ते पाच पानांवर स्पष्ट दिसते. सुरुवातीला पानाची मध्यशीर खालच्या बाजूने पिवळी पडते. नंतर पिवळसरपणा संपूर्ण पानावर वाढतो. यामुळेच या रोगाला पाने पिवळी पडणारा रोग किंवा यलो लीफ डिसीज (धडऊ) असे म्हणतात. पानाची मुख्य शिर पिवळी पडण्याची सुरुवात पानाच्या टोकाकडील भागापासून होऊन संपूर्ण शिर पिवळी पडते. असा पिवळसरपणा मध्यशिरपुरता मर्यादित राहतो किंवा शिरेच्या दोन्ही बाजूला मध्यशिरेला समांतर दोन-तीन सें.मी. पर्यंत वाढत जातो. या रोगाने आलेला पिवळसरपणा हा पक्व झालेल्या उसात ऑक्टोबर ते मार्चपर्यंत दिसून येतो. पिवळसरपणा मध्यशिरेपासून पूर्ण पानावर पसरत जातो. अखेरीस सर्व पाने पिवळी पडून वाळत आलेल्या भागाचा आकार इंग्रजी व्ही अक्षरासारखा दिसून येतो. या रोगाचे प्रमाण वाढल्यास पाने हळूहळू वाळत जातात. अशा प्रकारची लक्षणे लागवडीखाली असणाऱ्या बऱ्याच जातींवर आढळून येतात.

### ऊसरोग शास्त्र विभाग

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