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Foreword

During the 2023-24 crushing season, 207 sugar mills in Maharashtra started their crushing season of which, 105 are in cooperative and 103 are in private sector. The sugar mills in the state had crushed 107.61 million tonnes of sugarcane and produced 11.06 million tonnes of sugar. During season, 123 sugar mills have diverted around 0.86 million tonnes of sugar for ethanol production by use of BH molasses, sugarcane juice/sugar syrup as a feedstock. The average sugar recovery of the state remained as 11.08%. The production of ethanol allocated to state is 760.51 million liters out of which 728.62 million liters allocated for feedstock of sugar mills. As on May 31, 2024, sugar mills in the state had supplied 524.87 million liters to Oil manufacturing companies.

In the 2023-24 crushing season, India produced 31.70 million tonnes of sugar by crushing of 312.98 million tonnes of sugarcane. Due to restrictions of feedstock allocation, the sugar mills are diverted around 2.00 million tones sugar for ethanol production. According to the Petroleum Planning & Analysis Cell (PPAC) of India, the volume of ethanol delivered to Oil Marketing Companies (OMCs) by distilleries during the 2023/24 period, spanning from November 2023 to April 2024, amounted to 2.749 billion liters. Despite the government's initial aspiration to achieve a 15% ethanol blend by 2024, the projected ethanol inclusion has been maintained at 5.2 billion liters. This forecast aligns with the production levels of 2023 and is deemed inadequate for reaching the 15% blending target and a 20% goal for 2025, primarily due to the government-imposed limitations on the feedstock available for ethanol conversion.

VSI organized different events such as, Maharashtra Day, Technology Day and Blood Donation Camp apart from this workshops, training program and popular articles for farmers is given in this issue.

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 the farmers and industry's needs by trying to reduce the gap between the lab and the land.

RM Devarumath

(RM Devarumath)
Editor

EVENTS

64th Maharashtra Day

Vasantdada Sugar Institute celebrated 64th Maharashtra Day commonly known as *Maharashtra Din* which is celebrated annually on May 1st to commemorating the formation of the state of Maharashtra in India from the division of the Bombay State on May 1, 1960. It is celebrated to commemorate the creation of a Marathi-speaking state of Maharashtra. On this occasion National Flag hoisted by Mr. Sambhaji Kadupatil, Director General at VSI campus, in presence of Mr. Shivajirao Deshmukh, Advisor, Mr. DB Ghule, Registrar and guest of honor Dr. R. Vishwanthan, Director, Indian Institute of Sugarcane Research (IISR), Lucknow, staff members and students of VSI.

National Technology Day

Vasantdada Sugar Institute celebrated National Technology Day 2024 a day in advance on May 10, 2024 to deliberate on the marvels of innovation and progress. Dr. Santosh Mhaske, Senior Principal Scientist (F) and Professor, AcSIR at National Chemical Laboratory was invited as the chief guest on this occasion. The event was attended by the Director General, Mr. Sambhaji Kadupatil, all staff and students of the Institute. It commenced with a welcome by Dr. Deepali Nimbalkar, Head of the Department of Environmental Science, setting the tone for an engaging gathering. This was followed by lighting of the ceremonial lamp by the guest and dignitaries.

Dr. KS Konde, Head of the Department of Alcohol Technology, then introduced the chief guest for the function, Dr. Santosh Mhaske, highlighting his accomplishments in the field of technology, his work for the Pharma sector and his awards including the CIPLA-HAMIED Best Process Development Award for Rosuvastatin (Rosuvastatin belongs to a group of medicines called HMG-CoA reductase inhibitors, or statins. It works by blocking an enzyme that is needed by the body to make cholesterol, so this reduces the amount of cholesterol in the blood) by NCL-RF, 2022-2023. Dr. Mhaske was then felicitated by the Director General.

The Director General then addressed the gathering and highlighted the role of technology in modern life and developments. He also stressed on the significance of celebrating such days.

Dr. Mhaske in his lecture, not only elucidated the essence of Technology Day but also delved into a significant historical event-the nuclear tests conducted at Pokhran. He enlightened the audience about the pivotal role of technology in the successful execution of the tests, showcasing the indomitable spirit of scientific endeavor. This served as an inspiration for the students and a poignant reminder of the monumental achievements made possible through scientific ingenuity and technological prowess.

The function ended by a vote of thanks by Ms. Jyoti Kharde, Scientist, Soil Science section.

Blood Donation Camp

VSI organized a 'Blood Donation Camp' in collaboration with Tarpan Blood Bank of VishwaRaj Hospital, Loni Kalbhor, Pune on May 10, 2024. The event was inaugurated by Mr. SR Khengare, Chief Accountant in presence of Mr. DB Ghule, Registrar. On this occasion VSI staff members and students were participated in this program.

WORKSHOP

Integrated Nutrient Management – A Success Story

The first monthly workshop for the year 2024-25 on 'Integrated Nutrient Management – A Success Story' was organized by VSI on June 1, 2024. For the workshop, the Chief Guest was Dr. PH Rasal, Ex Professor, Dept. of Plant Pathology & Agriculture Microbiology, MPKV, Rahuri. The speakers from the sugar mills were Mr. SP Bhalekar, CDO, Pandurang SSK, Shripur, Dist. Solapur, Mr. Pankaj Patil, CDO, YM Krishna SSK, Karad, Dist. Satara.

Ms. Sudha Ghodke welcomed the chief guest, speakers, Heads of sections of AS & T Division and all the participants. Total 48 participants from 24 sugar mills were attended this workshop. The chief guest and speakers were felicitated by Dr. Ashok Kadlag, Principle Scientist (Crop Production & Protection).

Dr. Ashok Kadlag, in his opening remarks highlighted the importance of the topic of the workshop. He also briefed the importance of integrated nutrient management and its impact on yield & quality of sugarcane.

In the technical session, Dr. PH Rasal lecture on 'Use of Biofertilizers in sugarcane crop'. He explained about importance of beneficial microorganisms in universe and without them life is impossible. These *microorganisms* are essential for increasing sugarcane yield.

Ms. SD Ghodke, talked on 'Success of beneficial microorganisms in Integrated Nutrient Management'. She explained about the role of soil beneficial microorganisms and endophytic Nitrogen fixing bacteria for increasing yield and saving of inorganic fertilizers thereby increasing soil fertility.

Ms. Joyti Kharade delivered speech on 'Soil organic carbon management in sugarcane growing soil'. She emphasized importance of soil organic carbon for increasing soil biological health for increasing the yield of sugarcane.

Mr. SP Bhalekar delivered lecture on 'Management and use of integrated fertilizers in the operational area of KSP Pandurang SSK, Solapur'. He briefed the success story of increasing soil fertility and sugarcane yield in the area of operation by implementation of Integrated Nutrient Management. He also told that due to application of liquid biofertilizers and compost prepared from production unit of mill.

Mr. Pankaj Patil, talked on 'Success story of Integrated Nutrient Management in the operational area of YM Krishna SSK, Karad'. The mill has supplied liquid biofertilizers, compost & VAM in large quantity so increased sugarcane yield, soil fertility & thereby soil health in the area of operation.

After completion of lecture/technical session, the interactive session was held with the participants. The workshop was ended with vote of thanks by Ms. Jyoti Kharade, The recommendations of the workshop are as follows;

Recommendations

Plant cane

Name of Fertilizer	Method of Application	Time of Application
Liquid Biopesticide (BVM)	Drenching of BVM @ 2 lit/acre in 200 lit water (150 ml for 15 lit spray pump)	During planting of cane
Soil Health (SH)	Drenching of SH @ 1 lit/acre in 200 lit water (75 ml for 15 lit spray pump)	During planting of cane
Soil Health(SH)	Drenching of SH @ 1 lit/acre in 200 lit water (75 ml for 15 lit spray pump)	30 days after planting
Vasanturja	Foliar application of Vasanturja @ 1 lit/acre in 200 lit water (75 ml for 15 lit spray pump)	30 days after planting
Soil Health (SH) Multinutrient + Vasanturja	Drenching of SH @ 1 lit/acre in 200 lit water (75 ml for 15 lit spray pump) Foliar application of Multimacronutrient & Multimicronutrient @ 2 lit/acre each + Vasanturja @ 1 lit/acre in 200 lit water **Or** (150 ml Multimacronutrient & Multimicronutrient each + 75 ml Vasant Urja for 15 lit spray pump)	60 days after planting 60 days after planting
Liquid Biofungicide	Drenching of liquid biofungicide @ 1 lit/acre in 200 lit water (75 ml for 15 lit spray pump)	70 days after planting
Plant health	Foliar application of Plant health @ 1 lit/acre in 200 lit water. (75 ml for 15 lit spray pump)	75 days after planting
Soil Health (SH)	Drenching of SH @ 1 lit/acre in 200 lit water (75 ml for 15 lit spray pump)	90 days after planting
Multinutrient + Vasanturja	Foliar application of Multimacronutrient & Multimicronutrient + Vasanturja @ 1.5 lit/acre in 300 lit water. (150 ml Multimacronutrient & Multimicronutrient each + 75 ml Vasant Urja for 15 lit spray pump)	90 days after planting
Liquid Biopesticide (BVM)	Drenching of BVM @ 2 lit/acre in 200 lit water (150 ml for 15 lit spray pump)	120 Days after planting
Liquid Biopesticide (EPN)	Drenching of EPN @ 1 lit/acre in 200 lit water	After infestation of white grub

Application of liquid biopesticide and biofungicide as a precautionary measure for control of white grub and wilting of leaf.

Ratoon management

Name of Fertilizer	Method of Application	Time of Application
Liquid decomposing culture for trash mulching	50 kg Urea + 50kg Single super phosphate + spraying of DC culture @ 1 lit/acre in 200 lit water on trash (75 ml for 15 lit spray pump)	After harvesting of cane
Liquid Biopesticide (BVM)	Drenching of BVM @ 2 lit/acre in 200 lit water (150 ml for 15 lit spray pump)	During ratooning of cane
Soil Health (SH)	Drenching of SH @ 1 lit/acre in 200 lit water (75 ml for 15 lit spray pump)	During ratooning of cane
Soil Health (SH)	Drenching of SH @ 1 lit/acre in 200 lit water (75 ml for 15 lit spray pump)	30 days after ratooning
Vasanturja	Foliar application of Vasanturja @ 1 lit/acre in 200 lit water (75 ml for 15 lit spray pump)	30 days after ratooning
Soil Health (SH)	Drenching of SH @ 1 lit/acre in 200 lit water (75 ml for 15 lit spray pump)	60 days after ratooning
Multinutrient + Vasanturja	Foliar application of Multimacronutrient & Multimicronutrient @ 2 lit/acre each + Vasanturja @ 1 lit/acre in 200 lit water **Or** (150 ml Multimacronutrient&Multimicronutrient each + 75 ml Vasant Urja for 15 lit spray pump)	60 days after ratooning
Liquid Biofungicide	Drenching of liquid biofungicide @ 1 lit/acre in 200 lit water (75 ml for 15 lit spray pump)	70 days after ratooning
Plant health	Foliar application of Plant health @ 1 lit/acre in 200 lit water (75 ml for 15 lit spray pump)	75 days after ratooning
Soil Health(SH)	Drenching of SH @ 1 lit/acre in 200 lit water (75 ml for 15 lit spray pump)	90 days after ratooning
Multinutrient + Vasanturja	Foliar application of Multimacronutrient & Multimicronutrient + Vasanturja @ 1.5 lit/acre in 300 lit water (150 ml Multimacronutrient&Multimicronutrient each + 75 ml Vasant Urja for 15 lit spray pump)	90 days after ratooning
Liquid Biopesticide (BVM)	Drenching of BVM @ 2 lit/acre in 200 lit water (150 ml for 15 lit spray pump)	120 Days after ratooning
Liquid Biopesticide (EPN)	Drenching of EPN @ 1 lit/acre in 200 lit water	After infestation of white grub

- Apply Decomposing culture if sufficient water is available
- Application of liquid biopesticide and biofungicide as a precautionary measure for control of white grub and wilting of leaf.

TRAINING

Modern Technologies In Sugarcane Agriculture

The residential training program was organized for farmers from Kolhapur (Maharashtra) under Agricultural Technology Management Agency (ATMA). The objective of the training was to train the farmers about modern technologies in sugarcane agriculture. The three days training program was conducted during April 18-20, 2024.

Thirty-six farmers from two tahsils (Gadhinglaj:18 & Radhanagari: 18) of Kolhapur District of Maharashtra State were participated for the said training program. The training was inaugurated on April 18 , 2024 in presence of Heads of sections and representative staff members of VSI & participants.

Mr. BH Pawar, Scientist, Plant Pathology section welcomed all the participants and others. Lectures on various topics like sugarcane varieties & varietal planning, seed nursery management, tissue culture, modern planting techniques, weed management, soil fertility and fertilizer management, irrigation water management, use of bio-fertilizers, farm mechanization, sugarcane economics, ratoon management and integrated disease & pest management were conducted by Subject Matter Specialists. More emphasis was given on practicals and field demonstrations. In the plenary session of every batch, the trainees got their doubts cleared from the subject experts.

The concluding session was chaired by Hon. Director General of VSI. In the concluding function, the representative trainee farmers expressed satisfaction about the training, lodging and boarding facilities. The certificates along with group photos were distributed to the trainees. Director General has availed all the facilities at VSI campus during training period. The training program was concluded by vote of thanks.

Soil Testing and Integrated Nutrient Management

The training programme on 'Soil Testing and Integrated Nutrient Management' was organized by Soil Science Section, VSI for soil lab in-charge and soil chemist on May 14-18 , 2024. Total 27 trainees from 23 sugar mills and 04 from Krishi Vigyan Kendra attended this training programme. The training programme was inaugurated by Dr. AD Kadlag, Principal Scientist, (Crop Production and Crop Protection) and all Head of section from agriculture department are present. Dr. SA Surwase welcomes all the participants and briefed about the training programme.

In the inaugural address Dr. AD Kadlag, briefed about importance of soil testing and fertilizer recommendation based on yield targeting approach. He also explained the importance of soil fertility.

The training comprised of modern and scientific soil analysis methods and fertilizer recommendation covering the lectures and practical's. During the training , lectures on various topics like Advances in soil testing and fertilizer recommendation based on yield targeting approach, Use of GPS and GIS technique in soil fertility mapping, Agronomic interventions for sugarcane crop management, Fertigation in sugarcane, Use of biofertilizer in sugarcane, Advance technique in soil testing and fertilizer management, Preparation of standard solutions. In practical session soil chemical analysis like soil pH, electrical conductivity, organic carbon, available nitrogen, phosphorus, potassium, sulphur, exchangeable cations like calcium & magnesium, micronutrient like Fe, Mn, Zn, Cu, and Boron and physical analysis like bulk density, soil texture, analysis of carbonate, bicarbonate and chloride from saturation extract of salt affected soil are carried out.

In the interactive session, trainee raised queries were answered by the subject expert. The valedictory function of training programme was held on May 18, 2024 in presence of Mr. BH Pawar, Sr. Scientist, and Head Plant Pathology section and all Head of sections of agriculture. The certificate along with the group photos were distributed to the trainee and programme concluded with vote of thanks.

VSI Committee Meetings

VSI Committee a meeting in the month of April 2024 consists of purchase committee meeting was held on April 03, 2024 and technical committee meeting of Agriculture section was held on April 24, 2024. In the Month of May purchase committee meeting was held on May 30, 2024 and in the month of June 2024 investment committee meeting on June 01, 2024, Governing Council meeting under the chairmanship of Hon. President of VSI Mr. Sharad Pawar followed with selection committee meeting on June 21, 2024 and Technical committee meeting of technology department was held on June 22, 2024.

Technical Committee Meeting of Agriculture Sciences and Technology Division

The technical committee meeting of Agriculture Sciences and Technology Division was held on April 24, 2024 at VSI, Pune to assess the completed research program 2023-24, ongoing research and future research planning for the year 2024-25 of Agriculture Sciences and Technology Division of VSI, Manjari (Bk), Pune. The meeting was chaired by Dr. Indrajeet Mohite. Mr. Sambhaji Kadupatil, Director General, and Mr. Shivajirao Deshmuh, Advisor, VSI, Pune was attended the meeting. Dr. AD Kadlag, Principal Scientist (Crop Production and Protection) and Co-ordinator (Technical Committee) welcomed the Chairman, Director General, Technical Advisor and all the Scientists.

The committee took the review of all the sections viz., Plant Breeding, Molecular Biology and Genetic Engineering, Tissue Culture, Agronomy, Soil Science, Agriculture Engineering, Agriculture. Microbiology, Economics, Farm Management & Development, Entomology and Plant Pathology. The committee recommended the important suggestions to each sectional Head for further improvement.

Dr. Mohite expressed his views in introductory remarks that, the research experiments of Agriculture Science and Technology Division should be planned scientifically, need based and globally focused with current scenario of international standard. He also opined that the outcome of research should be enhancing for the unit area productivity with minimum human resource and more mechanization.

The scientist should try to tie up with other countries *viz* Philippine, Shrilanka, Central Africa, Brazil to harness the research opportunities other than present research programme. He also expressed his views regarding the strengthening of association with other states and International collaborations with the other countries.

Director General, VSI, Pune Mr. Sambhaji Kadupatil opined that the all the scientists should finalize the research programme and come out with sound recommendations for improvement in cane and sugar yield for benefit of the farmers. He also urged about the techniques for sugarcane yield maximization in the form of demonstration at VSI research farms and sugar factory jurisdiction farm.

Mr. Shivajirao Deshmukh stressed upon the improvement of research quality to emerge out the sound technology in the form of recommendations for the farmers and sugar industry.

VSI PARTICIPATION

Visit to Bagamoyo Sugar Ltd., Tanzania, East Africa

Agricultural Microbiology section of Vasantdada Sugar Institute, Pune provides technical guidelines for establishment of liquid biofertilizer production unit at different sugar mills. In this context, Ms. Sudha Ghodke, Scientist & Head, & Mr. BG Mali, Scientific Officer, Agricultural Micro-biology Section visited on April 1-7, 2024 for initial visit as per required by Bagamoyo Sugar Ltd., Tanzania for technical guidance for establishment of 25000 lit capacity liquid biofertilizer production unit. They visited site with staff of Bagamoyo Sugar Mill is near to irrigation yard of BSL farm, the total area 7000 sq. feet. We prepared layout for new building of liquid biofertilizer production unit. It was thoroughly discussed with Civil engineer, Electric engineer and drawing unit and finalized the layout. The technical staff submitted the list of Equipments, chemicals, miscellaneous items, packaging material etc. required for LBF production unit. We had detail discussion with Mr. EG Sadanand, CEO, Mr. UmeshIngawale, Agriculture Manager, Mr. Khanderao Pachore Chief Engineer, Mr. Ravi Chandra, Electric Engineer, Mr. Shanmugam, Civil Engineer regarding requirement of liquid bio-fertilizers, staffrequired, instrument wise and room wise Electricity load, Water requirement, Civil work, etc . for production unit. The staff has submitted copy of MOU & DPR to the management of Bagamoyo Sugar Ltd. Tanzania for completion of project smoothly & in time limit.

Later the discussion with Mr. Ramesh, Vice President, Mr. Anur Senapati, Chief Finance Officer and Ms. Anuradha Kothari regarding the financial requirement for establishing the lbf production unit. They also emphasized for establishing new building and submission of all requirement for 12300 lit production capacity initially.

Joint Agresco, PDKV, Akola

52nd Joint Agresco meet was organized at Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola during June 7-9, 2024. From VSI Dr. AD Kadlag, Principal Scientist, Crop Production and Protection, Dr. JM Repale, Sr. Scientist, Plant Breeding section, Dr. SG Dalvi, Scientist, Tissue Culture section, Ms. Sudha Ghodke, Scientist & Head, Agriculture Microbiology section and Ms. Jyoti Kharade, Scientist, Soil Science section were attended this meet.

From VSI, one variety release proposal (Plant Breeding) and one recommendation each from Soil Science, Tissue culture and Agriculture Microbiology sections were there.

Inaugural session was organized at Dr. KR

Thakare auditorium, Dr. PDKV, Akola on June 7. 2024. For inauguration, Chairman were Dr. SharadGadakh, VC, PDKV, Akola, Chief guest were Mr. Kiran Sarnaik, member Vidhan Parishad, Mr. Randhir Sawarkar, member Vidhan Sabha, Dr. Prashantkumar Patil, VC, MPKV, Rahuri, Dr. Indra Mani, VNMKV, Parbhani, Dr. Sanjay Bhave, Dr. BSKVP, DapoliMr. Kailash Mote, Director of Horticulture, Agril Department, GOM were present. Garlanding of Portrait of Dr. Panjabrao alias Bhausaheb Deshmukh& Lighting of Sacred lamp followed by Maharashtra &University Geet was done. Felicitation of Guests by dignitaries was done. Welcome address was done by Dr. VK Kharche, Director of Research, Dr. PDKV, Akola. Introductory Remarks was carried out by Dr. S. R. Gadakh Vice Chancellor, Dr. PDKV, Akola. Distribution of awards &release of publications was done by hands of dignitaries. Vote of thanks was done by Dr. Harihar Kausadikar Director (Research), MCAER, Pune.

Technical sessions were started on June 8, 2024. In Technical Session -II of Group IX on Variety Release Committee for Field Crops was organized at Committee Hall, College of Agriculture, Dr. PDKV, Akola. Dr. SR Gadakh, Vice Chancellor, Dr. PDKV, Akola were the chairman and Co-Chairman were Dr. KS Baig, Director of Research, VNMKV, Parbhani & Dr. RS Wagh, Associate Director of Research, MPKV, Rahuri. Members for this session were, Head, Dept. of Agril. Botany, MPKV, Rahuri; Head, Dept. of Agril. Botany, Dr. PDKV, Akola; Head, Dept. of Agril. Botany, VNMKV, Parbhani; Head, Dept. of Agril. Botany, Dr. BSKKV, Dapoli; Head, Dept. of Plant Pathology, Dr. BSKKV, Dapoli Head, Dept. of Agronomy, Dr. PDKV, Akola; Head, Dept. of Agril. Entomology, VNMKV, Parbhani; Head, Dept. of Biochemistry, MPKV, Rahuri. The recommendation was passed for VSI 18121 of Plant Breeding section.

Technical Session -II of Group VI on Plant Protection was started at Skill Development Training Center, Dr. PDKV, Akola. Chairman of the session was Dr. SS Mane, Dean, Dr.PDKV, Akola and Co-chairman was Dr. DB Undirwade, Director of Extension & Education, Dr. PDKV, Akola Dr. AM Nawale, Head, Department of Plant Pathology, MPKV, Rahuri presented the recommendations of Agril. Microbiology and Mushroom. The recommendation was passed on “Microbial slurry” of Agril Microbiology section.

Technical Session –II Group II: Natural Resource Management started at KrishiJagar Hall, Shetkari Sadan, Dr. PDKV, Akola Chairman, Dr. VK Kharche, Director of Research, Dr. PDKV, Akola and Co-Chairman, Dr. NG Patil, Director, ICAR-NBSS & LUP, Nagpur Dr. PS Bodake, Dean, Faculty of Agriculture, Dr. BSKKV, Dapoli. Dr. PH Vaidya, Head, Soil Science, VNMKV, Parbhani presented recommendations of Soil Fertility and Plant Nutrition and Dr. AD Kadlag, PS, CPP, VSI presented for chitosan. The recommendation for micronutrient grade I for calcareous soil of Maharashtra was passed for Soil Science section and irradiated & non-irradiated chitosan for Konkan region of Tissue culture section.

On June 9, 2024 , DAY-3, Plenary Session was started at Dr. K R Thakare Auditorium, College of Agriculture, Dr. PDKV, Akola. For this session chairman was Idzes A. Kundan, IAS, Principal Secretary (Agriculture), GoM and co-chairmen were Dr. PG Patil, Vice Chancellor, MPKV, Rahuri 2. Dr. Indra Mani, Vice Chancellor, VNMKV, Parbhani 3. Dr. SR Gadakh, Vice Chancellor, Dr. PDKV, Akola 4. Dr. SG Bhave, Vice Chancellor, Dr.BSKKV, Dapoli 5. Shri. RaosahebBhagade, Director of General, MCAER, Pune. Presentation of Recommendations was done by respective Chairman/ Co-Chairman/Rapporteurs.

Address and remarks was by the Chairman and Co-Chairmans, Shri. Raosaheb Bhagade, Director General, MCAER, Pune, Dr. SG Bhave, Vice Chancellor, Dr. BSKKV, Dapoli, Dr. SR Gadakh, Vice Chancellor, Dr. PDKV, Akola, Dr. Indra Mani, Vice Chancellor, VNMKV, Parbhani, Dr. PG Patil, Vice Chancellor, MPKV, Rahuri, Idzes A. Kundan, IAS, Principal Secretary (Agriculture), GoM.

Vote of thanks was done by Dr. VK Kharche, Director of Research, Dr. PDKV, Akola. The plenary session was completed with National Anthem .

National Conference at ICAR–National Bureau of Agriculturally Important Microorganisms, Mau, Uttar Pradesh

ICAR–National Bureau of Agriculturally Important Microorganisms, Mau, Uttar Pradesh (NBAIM) has organized National conference on June 10-11, 2024. The theme of the conference was 'Expanding the Horizons of Microbial Research in Agriculture'. The conference was inaugurated by Dr. TR Sharma, DDG (CS) ICAR, New Delhi and guest of honour Dr. SK Chaudhari (DDGNRM), ICAR, New Delhi & Dr. PK Chakrabarty, Former member (Plant Science), ASRB, New Delhi. Nearly 300 delegates were attended the conference from various ICAR research institute and KVK's.

Ms. Sudha Ghodke, Scientist & Head and Ms. Kranti Nigade, Scientist, Agricultural Microbiology Section, VSI have attended the conference. Under the theme of Microbiome Management, Microbial Diversity and Conservation there were seven technical sessions. The experts delivered technical knowledge on multiple issues of diversity of microbes, their conservation and role in sustainable agriculture, microbes for mitigating abiotic and biotic stress, bioprospecting of microbes for agriculture-application and challenges, plant disease diagnostics: current research trends, knowledge gaps, and opportunities.

Ms. Sudha Ghodke, Scientist & Head presented oral presentation under the technical session Microbial conservation and bioprospecting. Ms. Kranti Nigade presented the poster under the theme New Vistas in Microbial Research. The section received the first prize for poster presentation in National conference by the hand of Hon'ble Director, NBAIM, Mau, Uttar Pradesh.

VISITORS TO VSI

VISITORS TO VSI

Dr. Kunal Khemnar, Sugar Commissioner visited Vasantdada Sugar Institute on April 5, 2024. Mr. Sambhaji Kadupatil felicitated and briefed the activities of VSI in presence of all the HODs/HOSs of the departments. Later he visited some of the sections.

Dr. R Vishwanathan, Director of IISR, Lucknow, and Dr. AK Mall, Principal Scientist, as well visited VSI on May 1, 2024. They saw the sugarbeet research trial and Dr. AS Patil, Sci. Officer and I/C Head, Agronomy, explained the trial details. He also discussed about the future prospects. All of the Agriculture, Science, and Technology division's sectional heads were present during the visit.

Dr. BL Saraswat, Sr. Technical Consultant, Ministry of Agriculture & Farmers Welfare, Govt. of India, New Delhi, visited VSI on May 7-9, 2024. Shri. SambhajiKadupatil, Director General, welcomed the delegate by offering bouquet and shawl. Dr. AD Kadlag, Principal Scientist, Div. of Crop Production and Protection, gave brief presentation about the previous project of sugarbeet and also discussed future work outline. Dr. Saraswat raised question on various aspects of sugarbeet and it was satisfied by respective scientist. On May 08, 2024 Dr. Saraswat visited along with VSI Scientist Dr. AD Kadlag, Principal Scientist, Div. of Crop Production and Protection,and Dr. AS Patil, Sci. Officer & I/C Head, Agronomy at Baramati Agrofor understanding the practical aspects of sugarbeet processing. He also visited Shree Datta SSK, Shirol on May 9, 2024discussed with

Chairman about the sugarbeet crop, how it will benefited to the farmers as well as sugar mill. He expressed his satisfaction for hospitality and expertise of VSI in the sugar industry and cane and beet development.

Delegation consists of state officials and scientists from agriculture department of Madhya Pradesh state govt. along with officials from sugar commissioner office, Pune, visited VSI on May 21, 2024. Name of the officials viz., Mr. BS Durve, Additional Director (Sugar Cane); Dr. GK Kotu, Director, Agricultural Research services; Dr. SK Sharma, Director, Agricultural Research services; Dr. AK Srivastava, Head of Department, Dept. of Agricultural Economics; Dr. AK Chararjee, Chief Agricultural Scientist; Mr. RL Jamre, Deputy Director; Mr. RS Shakyawar, Deputy Director; Mr. Umesh Khatare, Deputy Director; Mr. Sanjeev Kumar Shakya, Asst. Director (Sugar cane); Mr. Abhishek Dubey, Asst. Director from Farmer welfare and agriculture dept.

Dr. RV Dani, Head & Technical Adviser, welcome the officers to the department and explained about the activities carried out by sugar technology department and procedure followed for FRP recovery calculation as per DFPD guide lines during the diversion of various feed stocks in the Maharashtra state. Mr. RN Ghorpade, Sugar Technologist, explained about the online software developed by the software team of sugar commissioner with the technical support from VSI for the FRP recovery

calculation. Mr. ST Chavan, Technical Adviser explained about the procedure followed by the VSI for the validation of the sugar mills diverted various feed stocks for ethanol production. 1. Statutory documents to be maintained by the sugar mill as per DFPD guide lines, 2. Intimation and timely information to the State excise, 3. Records to be maintained by the sugar mill, 4. Interim process validation report as per Director-S & VO & 5. Validation report prepared by VSI.

They have shown interest to implement the above system in their state also with the support from VSI. They wish to validate the sugar mills in their state also by VSI.

Mr. T. Balkrishnan, General Manager (Cane) and Mr. Gopinath, AGM (R&D) of Ponni Sugars (Erode) Ltd., Tamil Nadu, visited VSI on the May 28, 2024, Pune. Their visit aimed to explore potential collaborations between the sugar mill and the institute's research and development endeavors. A meeting of the officers from Ponni Sugars and the Heads of sections of the Agriculture Science and Technology Division of the institute chaired by the Principal Scientist (Crop Production and Protection). During the meeting Principal Scientist (Crop Production and Protection) highlighted officers from Ponni Sugars about the extensive facilities and resources available within the institute. Deliberations also revolved around identifying opportunities for joint initiatives. Following the meeting, the officers visited the Plant Breeding, Tissue Culture, Soil Science, Agricultural Engineering, and Agriculture Microbiology laboratory and discussed with Scientists.

A delegation from Illaj Sugar Ltd., based in Kaduna State, Nigeria, accompanied by representatives from KRESTON Projects, Pune visited the Institute on May 28, 2024. Led by Mr. Bishir Jalli, Vice-chairman, the delegation included Dr. Mukhtar Habib and Dr. Mohammed Lawal, representing Illaj Sugar Ltd., Nigeria.

A meeting was convened between the Nigerian delegation and Heads of Sections from the Agriculture Sciences and Technology Division of the Institute chaired by the Principal Scientist (Crop Production and Protection). During the meeting, the Principal Scientist elucidated on the ongoing research endeavours undertaken by the Agriculture Division and the Collaborative overseas consultancy work carried out by the institute.

The discussion about the collaborative work for the Cane Development at Nigeria for increasing cane yield was held and further action plan will be prepared to pursue the work after the mutual understanding. Following the meeting, the delegation had visited the various sections.

Mr. Sambhaji Kadupatil, Director General, VSI visited to the sugarcane-sweet sorghum field trial on June 4, 2024 along with Dr. AD Kadlag, Principal Scientist, Div. of Crop Production and Protection, Dr. KS Konde, Professor & Head, Dept. of Alcohol Tech. During this visited he learned about the objectives of the projects, he also knows about the production potential of ethanol from these cropping system. Further he visited to sugrabeet seed production project and discussed about the different crosses made and their output.

The team of Bhorameo Sahsksri Shakkar Utpadak Karkhana Maryadit,Kawardha, Chhattisgarh comprising of, Mr. GS Sharma, MD, Mr. Ankit Markam GM (adm) and Mr. BS Potpose, Chief Chemist visited VSI on May31, 2024.

Mr. Sambhaji Kadupatil felicitated them and briefed the activities ofthe VSI. During the visit HODs/HOSs of the Departments were present and they briefed the activities of the departments.

Dr. Manoj Charade, Assistant Professor& HOD PG Department, Government College of Pharmacy, Karad visited VSI on June 15, 2024. During this visit they visited various departments to learn about the research activities and facilities of the laboratories. Later they met Mr. Sambhaji Kadupatil, DG and Signed the MOU between Govt. College of Pharmacy and VSI for the research Collaborations with AT&T and Technology Departments.

Following Visitors were visited VSI during (April, May & June, 2024)

Name of Institutions	Visitors	Total
April - 2024		
Agriculture College Dongarshalki Tanda, Tal. Ugir, Dist. Latur	Faculties and Students	73
MIT ADT University, MIT College, Loni	Training Students	4
Shivaji University, Kolhapur	Professors	3
Jaywantrao Bhosale Krishna College of Agriculture, Rethare Bk., Tal. Karad, Dist. Satara	Faculties and Students	124
Individual Farmers from Maharashtra State	Farmers	350
May- 2024		
College of Biotechnology, Saralgaon, Tal. Murbad, Dist. Thane	Students	14
Various Agriculture College	Students	4
Ponni Sugars (Erode) Ltd., Erode, State Tamilnadu	Managers	2
Kreston Industrial and Infra Projects LLP, Pune, Dist. Pune	Officers	12
Individual Farmers from Maharashtra State	Farmers	392

Cont...

Following Visitors were visited VSI during (April, May & June, 2024)

Name of Institutions	Visitors	Total
June - 2024		
Krishi Vidnyan Sankul, Kashti (Malegaon), Malegaon, Dist. Nashik	Faculties and Students	61
Gencrest by products Pvt. Ltd., Andheri (East), Mumbai	Officers	4
MGM, Nanasaheb Kadam College of Agriculture, Gandheli, Chh. Sambhajinagar, Dist. Chh. SAmbhajinagar	Lecturers and Students	98
Modern College of Arts, Science & Commerece, Shivajinagr, Pune	Lecturers and Students	50
Symbiosis Institute of Health Science, Symbiosis International Instiyute, Lavale, Pune, Dist. Pune	Lecturers and Students	18
K.K. Wagh College of Agriculture Biotechnology, Panchvati, Nashik	Lecturers and Students	42
College of Agriculture Biotechnology, Loni, Tal. Karjat, Dist. Ahmednagar	Lecturers and Students	49
Modern College, Pune, Dist. Pune	Faculties and Students	52
MGM Nnasaheb Kadam College of Agriculture, Chh. Sambhajinagr	Faculties and Students	45
Individual Farmers from Maharashtra State	Farmers	360
	Total :	**1757**

Newly Released Sugarcane Variety CoVSI 18121 for Maharashtra

- CoVSI 18121 is amidlate maturing sugarcane variety, selected from the bi-parental cross between Co 86032 x CoT 8201 made at Sugarcane Breeding Institute, Coimbatore in the year 2012 and selected seedling from Ground Nursery-II (2013 Batch) during 2013-14.
- The mean Cane yield (t/ha) of CoVSI 18121 was 149.78 (t/ha) which was 18.23per cent higher over the standard Co 86032(126.69 t/ha).
- The mean CCS yield (t/ha) (commercial cane sugar yield) of CoVSI 18121 was 22.03 (t/ha) which was 19.53per cent higher over the standard Co 86032(18.43 t/ha).
- The average Commercial Cane Sugar (C.C.S.) % of CoVSI 18121 at 14th month was 14.95 which was 3.17 percent improvement over the standard Co 86032(14.49 %).
- The average sucrose % of CoVSI 18121 at 14th month was 20.88 which was 3.11 percent improvement over the standard Co 86032 (20.25 %).
- In red-rot testing by plug method of inoculation CoVSI 18121 showed MRreaction.
- In artificial smut reaction CoVSI 18121 rated as 'Resistant' at Pune center.
- CoVSI 18121 is 'Tolerant'for early shoot borer and internode borer.
- The CoVSI 18121 is a midlate maturing high cane and sugar yielding, high sucrose content, thick canewith better ratoonabilityand non-lodging plant type.

VASANTDADA SUGAR INSTITUTE
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वसंतदादा शुगर इन्स्टिटयुट निर्मित जैविक कीडनियंत्रणाद्वारे उसातील हुमणीचे निमंत्रण

सुधा घोडके
शास्त्रज्ञ व विभाग प्रमुख
कृषिसुक्ष्म जीवशास्त्र विभाग

क्रांती निगडे
शास्त्रज्ञ
कृषिसुक्ष्म जीवशास्त्र विभाग

अशोक कडलग
मुख्य शास्त्रज्ञ व प्रमुख
कृषी शास्त्र व तंत्रज्ञान विभाग

वसंतदादा शुगर इन्स्टिट्यूट, मांजरी बु.।।, पुणे

महाराष्ट्रात मागील काही वर्षामध्ये हुमणीचा प्रादूर्भाव वाढत चाललेला आपणांस दिसून येत आहे. सध्याच्या काळात ऊसाचे हेक्टरी उत्पादन घटत चालले आहे. त्यासाठी उसाला इतर आधुनिक तंत्रज्ञानाचा वापर करण्याबरोबरच उसाला कोणतीही कीड किंवा रोगांचा प्रादूर्भाव होऊनये याबाबत काळजी घेणे गरजेचे आहे. ऊस पीकावर आढळणाऱ्या प्रमुख कीडी म्हणजे खोडकीड, हुमणी, लोकरी मावा, पायरिला खवले कीड, कांडी कीड व पांढरी माशी या सर्व कीडींच्या नियंत्रणासाठी शेतकरी वर्गाकडून मोठया प्रमाणात रासायनिक औषधाचा वापर केला जात आहे. या रासायनिक औषधांचे पर्यावरण व आरोग्य विषयक दुष्परिणाम आपणा सर्वांना ज्ञात आहेत. हे दुष्परिणाम टाळण्यासाठी कीड नियंत्रणाच्या विविध जैविक पध्दतींचा विकास झाला आहे.

महाराष्ट्रात प्रामुख्याने दोन प्रकारच्या हुमणी आढळतात. त्यामध्ये नदी काठावरील व माळरानावरील हुमणी असे वर्गीकरण केले जाते. हुमणीची प्रजात लिकोफोलीस ही नदीकाठावर तर होलोट्रॅकिया ही माळरानावर आढळते. माळरानावरील हुमणीची प्रजात मोठया प्रमाणावर पिकांचे नुकसान करते. हुमणीच्या प्रादूर्भावामुळे ऊ स उगवणीमध्ये ४०% तसेच उत्पादनामध्ये हेक्टरी १५ ते २० टनापर्यंत नुकसान होते. सद्य परिस्थितीत महाराष्ट्रात हवामानातील बदल व सिंचनासाठी उपलब्ध पाण्याची मर्यादा यामुळे उसामध्ये हुमणीचा प्रादूर्भाव वाढलेला आढळून येत आहे. राज्यात मागील काही वर्षांमध्ये मोठया प्रमाणात हुमणीचा प्रादूर्भाव कोल्हापूर, सांगली, पुणे, अहमदनगर, सोलापूर इ. जिल्हयांमध्ये वाढलेला दिसतो.

हुमणीचा जीवनक्रम

हुमणीची जीवनावस्था चार प्रमुख टप्प्यांमध्ये करण्यात आली आहे-भुंगेरे, अंडी, अळी व कोष

- प्रथम अळी अवस्था पांढरीशुभ्र, पिवळे डोके, सुमारे ८ मी.मी. लांबी असते.
- पूर्ण विकसीत अळया पिवळट-सफेद, डोक्याचा रंग बदामी व इंग्रजीच्या 'सी' अक्षराप्रमाणे अर्धगोलाकार असते.
- पूर्ण विकसित अळीची लांबी सुमारे ४० ते ४५ मी.मी. असते.
- प्रौढ भुंगेरा - तपकिरी किंवा बदामी रंग १८ ते २० मी.मी. लांब व ८ मी.मी. पर्यंत जाड पंखाची प्रथम जोडी ढालीप्रमाणे मजबूत, पखांची दुसरी जोडी पातळ असते.

हुमणीचा जीवनक्रम

पहिल्या पावसानंतर मे किंवा जून मध्ये प्रौढ भुंगे सुप्तावस्थेतून बाहेर येतात. कडूनिंब, बाभूळ, बोर यासारख्या झाडांवर मिलनासाठी जमतात. सुर्योदयापूर्वी मादी जमिनीमध्ये अंडी घालते. एक मादी ५० ते ७० अंडी घालते. अंडयातून अळी बाहेर पडते. दोनदा कात टाकून ५ ते ९ महिन्यांमध्ये पूर्ण वाढते. त्यानंतर पूर्ण वाढ झालेली अळी कोषावस्थेत जाते. साधारणतः १४ ते १९ दिवसांनी प्रौढ भुंगे बाहेर पडतात.

- मे, जून, जुलै-प्रौढ सुप्तावस्थेतून निघतात व मादी अंडी घालते.
- ऑगस्ट ते नोव्हेंबर-अळी पिकांची मुळे खावून उपजीविका करते.
- नोव्हेंबर-जमिनीत कोषावस्थेत असते.
- जानेवारी ते मे-प्रौढ भुंगेरे जमिनीमध्ये सुप्तावस्थेत राहहतात.

नुकसानीचा प्रकार

प्रथम अवस्थेतील हुमणीच्या अळया अंडयातून बाहेर निघाल्यानंतर जमिनीतील कुजलेल्या सेंद्रिय पदार्थावर किंवा जीवंत मुळांवर उपजीविका करतात. त्यानंतर दुसऱ्या व तिसऱ्या अवस्थेतील अळया ऊस व इतर पिकांची मुळे खातात. मुळे खाल्यामुळे पिकाचे अन्न व पाणी घेण्याचे कार्य बंद पडते. पाने हळूहळू पिवळी पडण्यास सुरुवात होते. ऊ स निस्तेज दिसतो. प्रादूर्भावग्रस्त ऊ साला हलका झटका दिल्यास ऊ स सहजासहजी उपटून येतो.

नियंत्रण

एक हुमणीची अळी प्रति एकर एक घनमीटर अंतरात आढळून आल्यास कीड नियंत्रण करावे. सरासरी २० अगर त्यापेक्षा जास्त भुंगेरे आढळल्यास, कडूनिंब अथवा बाभळीची पाने अर्धचंद्राकृती खालेली आढळल्यास नियंत्रणाचे उपाय योजावेत.

हुमणीच्या नियंत्रणासाठी जीवनक्रमानुसार उपाययोजना

- मे ते जुलै-प्रौढावस्थेचे नियंत्रण-प्रौढ भुंगेरे सायंकाळी जमिनीतून बाहेर येतात व बांधावरील यजमान झाडांची पाने खातात. रात्रीच्या वेळी प्रकाश सापळे लावून त्यांना आकर्षित करावे.

- संध्याकाळी व रात्री झाडांच्या फांदया जोरात हालवून प्रौढ खाली पाडावेत. ते गोळा करुन केरोसीन व कीटकनाशक मिश्रित पाण्यात टाकून नष्ट करावेत. हे काम सामुदायिकरित्या करणे अधिक फायदेशीर ठरते.
- उन्हाळयात खोल नागंरट करावी त्यामुळे कीडींच्या अंडी व अळी सुर्यप्रकाशात संपर्कात येऊ न नष्ट होतात.
- अर्धवट कुजलेल्या शेणखत व कंपोष्ट खत आदींद्वारे हुमणीची अंडी व अळयाचे शेतात प्रसरण होते.
- अळी अवस्थेच्या नियंत्रणासाठी शेतकरी वर्गाकडून मोठया प्रमाणात रासायनिक औषधांचा वापर केला जातो. या रासायनिक औषधांचे दुष्परिणाम टाळण्यासाठी कीड नियंत्रणाच्या विविध जैविक पध्दतीचा विकास झाला आहे. त्यामध्ये कीडींवर पोसणाऱ्या अथवा नैसर्गिक शत्रुंचा वापर, कामगंध सापळयांचा वापर तसेच एकात्मिक कीड नियंत्रण पध्दतीचा समावेश होतो.

जैविक पध्दतीने हुमणीचे नियंत्रण

यामध्ये प्रामुख्याने हुमणी कीडीच्या नैसर्गिक शत्रुंचा वापर केला जातो. हुमणीचे नैसर्गिक शत्रू-जीवाणू, बुरशी, परोपजीवी सुत्रकृमी यांचा वापर कीडींचा नायनाट करण्यासाठी केला जातो.

१) मित्र बुरशींचा वापर

बव्हेरिया बसियाना व मेटारायझियम ॲनिसोपली या बुरशींचा वापर हुमणी नियंत्रणासाठी केला जातो. या बुरशी कीडींच्या शरीरात वाढतात. त्यामुळे हुमणी कार्यहीन होऊन संपुष्टात येते. वसंतदादा शुगर इन्स्टिटयुट ने ''जैविक कीड नियंत्रक'' विकसीत केले आहे. यामध्ये बव्हेरिया बसियाना, मेटारायझियम ॲनिसोपली, व्हर्टीसिलियम लेकनी या बुरशींसह बॅसिलस थुरिनजेनेसिस या जीवाणूंचा समावेश आहे. हे जैविक कीड नियंत्रक म्हणजे हुमणीच्या अळी व भुंगेरे यावंर वाढणाऱ्या परोपजीवी बुरशींचा समुह असलेली द्रवरुप कीड नियंत्रक आहे. या जैविक कीड नियंत्रकाचा वापर एकरी २ लिटर ४०० लिटर पाण्यात मिसळून जमीन वाफश्यावर असताना बेटाजवळ आळवणी करावी. ही आळवणी साधारणपणे मे महिन्याच्या दुसऱ्या पंधरवडयात व त्यानंतर जून किंवा जुलैमध्ये प्रत्येकी एकदा याप्रमाणे वापर केल्यास हुमणीचे प्रभावीपणे नियंत्रण करता येते.

वसंतदादा शुगर इन्स्टिटयुटच्या प्रक्षेत्रावर बीव्हीएम या जैविक कीड नियंत्रकाची उसाच्या शेतात चाचणी घेतल्यावर असे आढळून आले की, बी.व्ही.एम वापरल्यास हुमणीचे नियंत्रणाबरोबर ऊस उत्पादन देखील वाढल्याचे दिसून आले.

२) परोपजीवी सुत्रकृमींचा वापर (ई.पी.एन.)

एंटोमोपॅथोजेनेकि निमॅटोड (ई.पी.एन.) म्हणजे कीडीच्या शरीरावर वाढणारे सुत्रकृमी, हुमणीला रोगग्रस्त करणारे सुत्रकृमी हेटेरोरॅबडिटिस व स्टर्इनर्निमिटिडीस या दोन प्रकारचे आहेत. वसंतदादा शुगर इन्स्टिटयुटने हुमणी नियंत्रणासाठी द्रवरुप स्वरुपातील ई.पी.एन. हे जैविक कीड नियंत्रक विकसित केले आहे. हे जमिनीमध्ये आढळणारे सुत्रकृमी असून, जमिनीमध्ये हुमणीला शोधून तिच्या शरीरात त्वचेवरील छिद्रांद्वारे किंवा तोंडावाटे प्रवेश करतात. किडीला रोगग्रस्त करुन तिच्या शरीरात वाढतात. मृत कीडीच्या शरिरातून बाहेर पडून जमिनीमध्ये दुसऱ्या हुमणीला शोधून तिला रोगग्रस्त करतात. ई.पी.एन. या जैविक कीड नियंत्रकांचा वापर प्रति एकर १ लिटर २०० लिटर पाण्यात मिसळून जमीन वाफश्यावर असताना बेटाजवळ आळवणी पध्दतीने करावा. वापर केल्यानंतर जमिनीमध्ये वाफसा स्थिती सतत ठेवल्यास चांगला परिणाम दिसून येतो. ई.पी.एन. हे हुमणीचे नैसर्गीक शत्रू असल्याने त्यांचा जमिनीतील उपयुक्त जीवाणू, वातावरण, पिकांवर तसेच मानवी आरोग्यावर विपरीत परिणाम होत नाही.

हुमणीचे नियंत्रण किडीचा जीवनक्रम लक्षात घेवून कीड व्यवस्थापन पध्दतीचा अवलंब सामुदायिक मोहिम राबवून केला तर प्रादूर्भाव आटोक्यात येतो.

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पावसाळा हंगामात ऊस पिकावर रोगांचा प्रादुर्भाव व प्रसार टाळण्यासाठी प्रतिबंधात्मक उपाययोजना

गणेश कोटगिरे आणि भरत पवार
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 75 मे.टन. इतके होते. महाराष्ट्रात मात्र ऊस उत्पादकता हेक्टरी 85 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 30 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 अन्नद्रव्याचा निचरा होतो किंवा ती पाण्याद्वारे वाहून जातात; यामुळे पिकाचे पोषण व्यवस्थीत 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 419, कोसी 671, व्हीएसआय 434, को 86032, एमएस 10001 आणि कोव्हीएसआय 9805 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 हंगामापुर्वी 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 किटकाद्वारे होतो.


पाने एकमेकात गुरफटणे


पाने सडणे किंवा कुजणे

कांडी काप (नाइफ कट)

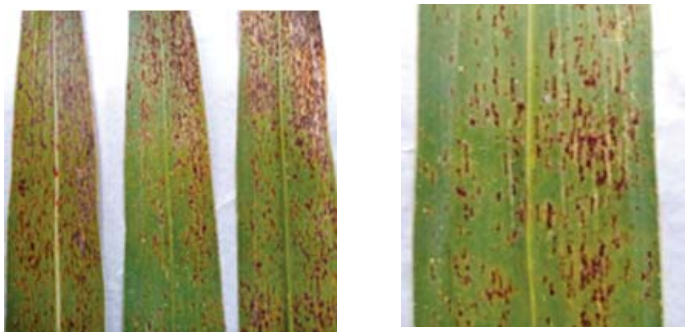
पोक्का बोंग रोग नियंत्रणाचे उपाय

- रोग लागण झालेल्या शेतातील शेंडेकुज झालेले व पांगशा फुटलेले ऊस शेतातून वेगळे काढावेत व जाळून नष्ट करावेत व नंतर रोगाच्या नियंत्रणाकरिता 0.2 टक्के कॉपर ऑक्झिक्लोराईड (1 लिटर पाण्यात 2 ग्रॅम बुरशीनाशक) किंवा 0.1 टक्के कार्बेंडेझिम (1 लिटर पाण्यात 1 ग्रॅम बावीस्टीन) किंवा 0.3 टक्के मॅकोझेब (1 लिटर पाण्यात 3 ग्रॅम डायथेन एम 45) यापैकी एका बुरशीनाशकांच्या 10 दिवसांच्या अंतराने स्टीकर वापरून 2 ते 3 फवारण्या कराव्यात.
- पिकास खतांची मात्रा माती परिक्षणानुसार योग्य प्रमाणात योग्य वेळी द्यावी.

तपकिरी तांबेरा

तपकिरी तांबेरा हा रोग पुकसिनीया मॅलॅनोसिफॅला या हवेद्वारे पसरणाऱ्या बुरशीमुळे होतो. तांबेरा रोगामुळे ऊस पिकाचे 40 टक्केपर्यंत नुकसान होवू शकते. को 419, कोसी 671, कोव्हीएसआय 9805, को 92005, एमएस 10001, व्हीएसआय434 आणि कोएम 0265 या ऊस जाती रोगास जास्त बळी पडतात; तर अलिकडे को 86032 या ऊस जातींवर 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 सुरूवातीस 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 बिजाणूंच्या 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 बोटास 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 (कोव्हिएसआय 03102, व्हिएसआय 08005) लागण करावी.
- पिकास खतांची मात्रा माती परिक्षणानुसार योग्य वेळी द्यावी. नत्रयुक्त खताचा तसेच इतर खतांची मात्रा उशिरा देऊ नये. पावसाळ्यात शेतातून अतिरिक्त पाण्याचा निचरा करावा.
- तांबेरा रोग दिसून आल्यावर लगेचच 0.25 टक्के प्रमाणात प्रोपिनेब (उदा. अँट्राकॉल, 1 लिटर पाण्यात 2.5 ग्रॅम बुरशीनाशक) किंवा 0.3 टक्के प्रमाणात मॅकोझेब (उदा. डायथेन एम 45, 1 लिटर पाण्यात 3 ग्रॅम बुरशीनाशक) या बुरशीनाशकाच्या 10 दिवसांच्या अंतराने स्टीकर वापरून 2 ते 3 फवारण्या कराव्यात. रोगाचा जास्त प्रादुर्भाव असेल तर फवारणीपुर्वी रोगग्रस्त आणि वाळलेली पाने शेताबाहेर काढावीत.

तपकिरी ठिपके

हा रोग सरकोस्पोरा लॉंगीपस या बुरशीमुळे होतो. पुर्वीच्या संदर्भानुसार या रोगाचा प्रादुर्भाव उसपिकावर वर्षभर आढळत असला तरी पावसाळ्यात अतिवृष्टीनंतर या रोगाची तिव्रता वाढते. जादा आर्द्रता आणि 25 ते 30 सें.ग्रे. दरम्यानचे तापमान या रोगास प्रादुर्भावास आणि प्रसारास अनुकुल

आहे. महाराष्ट्राशिवाय या रोगाची लागण ऊस पिकावर कर्नाटक, गुजरात आणि गोवा राज्यात आढळलेली आहे. महाराष्ट्रात कोएम 0265 आणि को 86032 या ऊस जाती रोगास जास्त बळी पडतात.

तपकिरी ठिपके रोगाची लक्षणे

रोगाची लागण पानावर झाल्याने लाल–तपकिरी रंगाचे ठिपके उसाच्या पानांवर दिसून येतात. ठिपक्यांचा आकार टाचणीच्या टोकापासून ते 3 ते 15 मिमी इतका आढळतो. पानावरील ठिपके अंडाकृती किंवा लंबगोलाकार असून त्यांच्या सभोवतालचा भाग पिवळा दिसतो. सामान्यपणे पानाच्या दोन्ही बाजूस ठिपके सारखेच दिसतात. उसाच्या कोवळ्या पानांपेक्षा जुन्या पानांवर ठिपके जास्त प्रमाणात दिसतात; तसेच ठिपके पानांवर सर्वत्र सारख्या प्रमाणात विखुरलेले आढळतात. रोगाची तीव्रता वाढल्यांवर ठिपके पानाचा पुर्ण भाग व्यापतात आणि ते एकमेकात मिसळतात. तदनंतर पाने पुर्णपणे करपतात आणि वाळतात. दूरवरून रोगग्रस्त पिक तांबेरा रोगाने ग्रासल्यासारखे दिसते. पाणांची पुर्ण वाढ होण्याआधीच पाने पिवळी पडतात आणि पानांकरवी होणारे प्रकाश संश्लेषणाचे आणि साखर तयार करण्याचे काम मंदावते किंवा थांबते.

तपकिरी ठिपके रोगाची लक्षणे

रोग नियंत्रणाचे उपाय

1. पिकास सेंद्रीय, रासायनिक आणि जैविक खताची मात्रा माती परिक्षणानुसार वेळेवर द्यावी. तसेच पावसाळा हंगामात शेतात पाणी साचणार नाही अशा पद्धतीने निचरा व्यवस्था करावी.
2. रोगाची लागण दिसून आल्यावर लगेचच ताम्रयुक्त बुरशीनाशकाच्या 0.2 % या प्रमाणात उदा. कॉपर ऑक्झीक्लोराईड 2 ते 3 फवारण्या 15 दिवसाच्या अंतराने स्टिकरचा वापर करून कराव्यात. या बुरशीनाशकाशिवाय मँकोझेबयुक्त बुरशीनाशकसुद्धा (उदा. डायथेन एम 45) 0.3 % या प्रमाणात रोगाच्या नियंत्रणासाठी परिणामकारक आहे.

या व्यतिरिक्त ऊस पिकात पानावरील ठिपके (लीफ स्पॉट) आय स्पॉट, येलो लीफ डिसीज या रोगांचा प्रादुर्भाव दिवसेंदिवस वाढत असल्याचे निदर्शनास आलेले आहे. दक्षिण महाराष्ट्र तसेच महाराष्ट्राच्या पश्चिम भागात जास्त पावसामुळे पानावरील रोगांचा प्रादुर्भाव संयुक्तरित्या आढळतो. रोगामुळे ऊसाची सर्व पाने करपून गेलेली आढळतात. त्यामुळे ऊसाच्या व साखरेच्या उत्पन्नात मोठ्या प्रमाणावर घट होते. कांडी कूज व अननस या लागणीनंतर ऊस बेण्यास होणाऱ्या रोगाचा प्रादुर्भाव जास्त खोलीच्या जमिनीत लागण केलेल्या कांड्यावर 5 टक्के पर्यंत आढळतो; या रोगामुळे ऊसाची उगवण कमी होते. याकरिता पाणी व्यवस्थापन उत्तमरितीने करावे. पाणी शेतात जास्त काळ राहून दलदल होणार नाही याची काळजी घ्यावी. ठिबक सिंचन या सिचनाच्या शास्त्रशुद्ध पद्धतीचा वापर करणे ही काळाची गरज आहे.

पावसाळा हंगामात ऊस पिकावर रोगांचा प्रादुर्भाव आणि प्रसार टाळण्या ासाठी प्रतिबंधात्मक उपाय

1. ऊस लागवडीकरिता निचरायुक्त जमिनी असाव्यात. ऊस पिकाचा कालावधी मोठा असल्याने जमिनीच्या समस्या टाळण्यासाठी जमिनीची पूर्व मशागत चांगली करावी. ऊस लागवडीकरिता रूंद सरी किंवा पट्टा पद्धतीची रानबांधणी करावी. हंगामनिहाय व जातनिहाय लागवडीचे नियोजन करावे. शिफारस केलेल्या ऊसजातींची लागण करावी.
2. लागणीसाठी बेणेमळ्यातील बेण्याचा वापर करावा. बेणे मळ्यातील बेणे उपलब्ध नसल्यास 10 ते 11 महिने वय असलेल्या लागणीच्या पिकातील रोग व कीडमुक्त ऊस बेण्यासाठी वापरावा.
3. ऊस बेण्यास लागणीपूर्वी कार्बेंडेझिमयुक्त बुरशीनाशकाची (बावीस्टीन 100 ग्रॅम) व कीटकनाशकाची (इमिडाक्लोप्रिड 70%, 36 ग्रॅम) 100 लिटर पाण्यात मिसळून 10 ते 15 मिनिटे प्रक्रिया करावी.
4. खोल काळ्या जमिनीत उसाची लागण कोरड्या पद्धतीने करावी, जेणेकरून कांड्यांची लागण खोलवर होणार नाही. अशा ठिकाणी रोपांचा वापर करावा.
5. सेंद्रिय, रासायनिक व जैविक खतांचा वापर माती परिक्षण अहवालानुसार व वेळेवर करावा.
6. आंतरमशागतीची कामे उदा. तणनिर्मुलन, उसाची बाळबांधणी व मोठी बांधणी वेळेवर करावी.
7. ऊस पिकावरील किडींचे नियंत्रण वेळीच करावे; जेणेकरून रोगाच्या प्रसारास आळा बसेल.
8. ऊस पिकात कणखरपणा वाढण्यासाठी सल्फर, कायटोसान आणि सिलीकॉन युक्त उत्पादनांचा वापर फायदेशीर आहे.

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