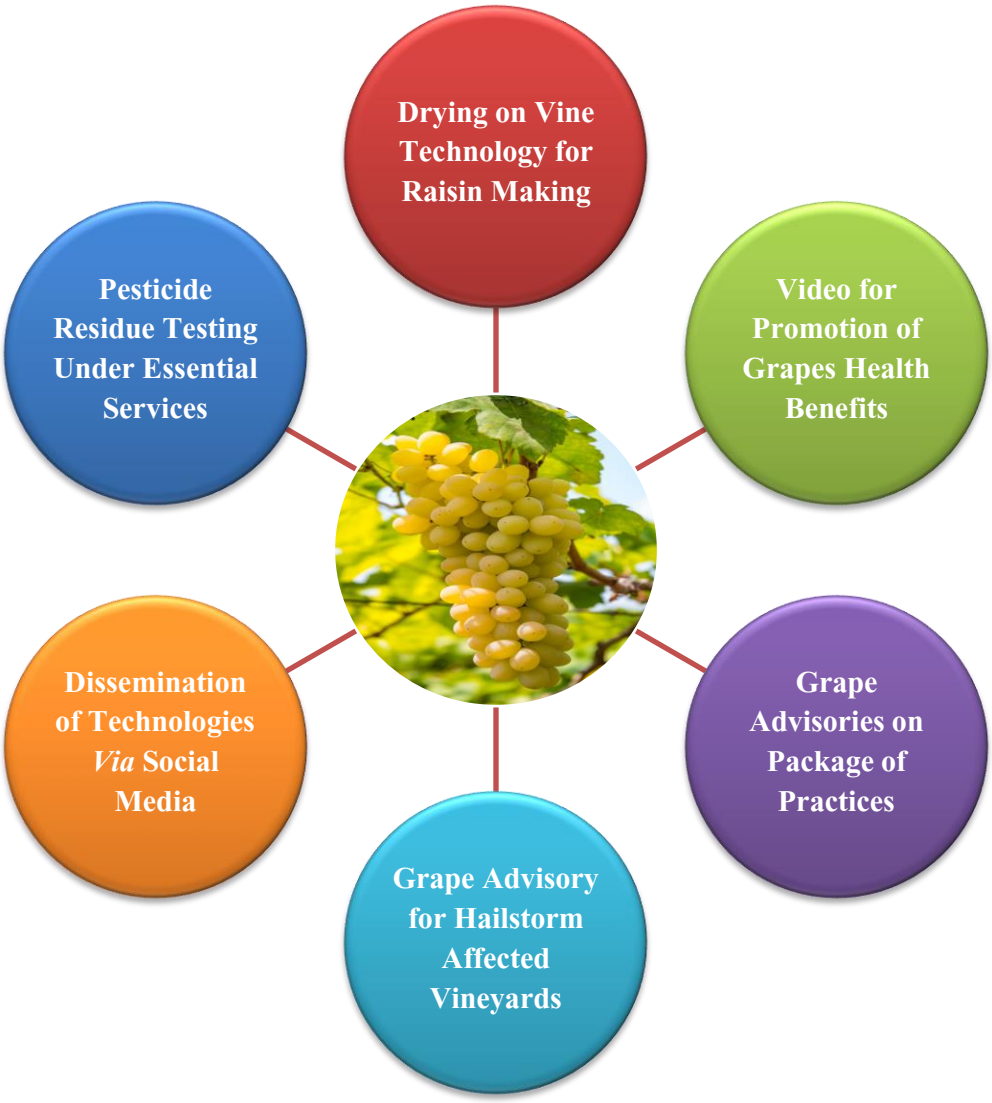
Extension Bulletin No. 42

Initiatives to Reduce the Impact of COVID-19 Pandemic on Grape Industry



भाकृअनुप-राष्ट्रीय अंगूर अनुसंधान केंद्र, पुणे

ICAR-National Research Centre for Grapes, Pune

Extension Bulletin No. 42

Initiatives to Reduce the Impact of COVID-19 Pandemic on Grape Industry

भाकृअनुप-राष्ट्रीय अंगूर अनुसंधान केंद्र, पुणे

ICAR-National Research Centre for Grapes, Pune

Citation:

Somkuwar, R.G. 2022. Initiatives to reduce the impact of Covid-19 pandemic on grape industry. Extension Bulletin No.42, ICAR-NRC Grapes, Pune.25 p.

Extension Bulletin No. 42

March, 2022

Contributed by:

R. G. Somkuwar, Anuradha Upadhyay, Ajay Kumar Upadhyay, Kaushik Banerjee, Ajay Kumar Sharma, Sujoy Saha, Deependra Singh Yadav, Ahmed Shabeer, S. D. Ramteke, Kavita Mundankar, N. A. Deshmukh, Yukti Verma, Dhananjay Gawande, Roshni Samarth, Somnath Holkar, Prashant Nikumbhe and Anupa, T.

Published by:

Dr. R.G. Somkuwar, Director
ICAR-National Research Centre for Grapes
P.B. No. 3, Manjari Farm P.O.
Solapur Road, Pune-412307,
Maharashtra, India

Cover design: N. A. Deshmukh

CONTENTS

1. Introduction

Grape (*Vitis vinifera* L.) is basically a temperate crop, gained significance under tropical climatic condition due to technological advancement. In India, grapes are grown on an area of 1.40 lakh hectare with production of 31.25 lakh MT and productivity of 21.00 MT/ha (NHB, 2020) with a major share of Maharashtra (75.94 %) followed by Karnataka (19.15 %) and Mizoram (1.76 %). Tamil Nadu (1.55 %), Andhra Pradesh (0.58 %), Telangana (0.25%) and Punjab (0.21%) are other grape growing states. The country has exported about 1,93,691 MT grapes worth Rs. 2,17,687 lakhs (APEDA 2020). Maharashtra and Karnataka are the major grape growing regions, where grapes mature during January-April. In these regions, double pruning and single cropping pattern is followed. After the harvest of crop, foundation pruning is done during first week of April while forward pruning is done during October. During this period, the grapevine encountering with any unusual situation will leads to subsequent loss of income of farmers and foreign exchange of the country.

In 2020, before the announcement of lockdown (22nd March), grape growers were realizing Rs. 50-95 per kg of grapes for export purpose and about Rs 50 per kg for domestic market. As per the estimates provided by Maharashtra Rajya Draksh Bagaitdaar Sangh (MRDBS), at the time of lock down only 70-75% crop was harvested and remaining 25-30% crop was still at late stages of ripening. In Maharashtra, about 9 lakh MT grapes were still in vineyards, out of which 4.0 to 4.5 lakhs MT were in Nashik district alone.

2. Impact of lockdown on grape industry

1) During lockdown, the movement of public was restricted and farm labours migrated to their native states resulting in labour shortage. This has hampered the grape harvest severely forcing the growers to leave the mature grapes on the vines itself.
2) The functioning of the nominated laboratories involved in residue testing for export purpose were adversely affected. As a result, grape exporters could not obtain mandatory pesticide test report for exporting grape to EU adversely affecting the export.

3) Lockdown also restricted the movement of produce. The produce harvested just before the announcement of lockdown could not be transported to wholesale market. The growers were clueless and some of them sold produce for as less as Rs 7-10 per kg, which was not sufficient to meet the production cost.

4) Grape is a specialized crop and requires constant attention. Generally, there is great deal of interaction between growers and scientists of this Centre happen during foundation pruning via field visits or growers' seminars in different regions of Maharashtra and Karnataka. These events are attended by a large number of growers and technical guidance is provided for obtaining good crop during coming season. During lockdown, these field visits, growers' seminars, group discussion/interactions became difficult.

3. Centres initiatives

During pandemic, Centre organised series of discussion with grape growers; MRDBS officials etc. to assess the situation and immediately took efforts to reach to the farmers and reduce their hardship. The initiatives taken by ICAR- National Research Centre for Grapes, Pune during this difficult time is summarised below.

a. Drying on vine technology for raisin making

In Maharashtra, majority of grape growers in Nasik region focus on table grape production for export purpose. During lockdown, the grapes from this region could not be harvested and the export was restricted. The Centre had earlier conducted experiments on 'Drying on Vine (DOV)' process of converting the grapes into dried grapes (Fig 1). Based on those results, the growers were advised to adopt this technology to convert their unharvested grapes into raisins. Protocols for DOV and grape drying between two rows of vines were circulated through social media (WhatsApp groups, ICAR-NRCG website, Agrowon, etc). A small video on method of grape drying was uploaded on YouTube channel of ICAR-NRCG and also circulated through different media.

Steps involved for drying on vine technology

I. Drying the grape bunches on vine

1. Partially cut the bunch bearing shoots leaving 2-3 buds from the base.

2. Spray the dipping oil (ethyl oleate @15 ml/l + potassium bicarbonate @ 25 ml/l) on bunches.

3. Repeat the spray once after 3-4 days.

4. Collect the raisins after 13-14 days.

II. Drying the grape bunches in between the rows

1. Harvest the grape bunches.

2. Spread the harvested grapes on shade nets/tarpaulin sheets laid in between the rows.

3. Spray ethyl oleate @15ml/l + potassium bicarbonate @25ml/l on the harvested bunches.

4. Repeat the spray once after 3-4 days and turn the grapes two-three times.

5. Collect the raisins after 14-15 days.

Fig 1. Drying grapes on vine for raisin making

A. Spray of ethyl oleate and potassium carbonate solution on grape bunches; B. Early stages of drying, C. Prepared raisins

The suggested methodologies were adopted by the grape growers of different grape growing regions. Mr. Subhas Arve, (Sangli) and Mr. Rohit Chauvan, (Indapur) adopted the technology and converted their fresh grapes into raisins. Mr. Rohit Chavan used this process to prepare raisins from Nanasaheb Purple grapes covering about 30 acres. He produced about 20 tonnes raisin which fetched him @ Rs. 70/kg. Mr. Subhas Arve, an agriculture graduate grows grapes on an area of about 150 acres. He used this process to convert 50 acres of (Thompson Seedless) grapes to raisins and produced about 30 tonnes of raisin.

To encourage other grape growers, success stories of these two farmers were published in Marathi agriculture daily Agrowon (Fig 2). These articles encouraged many farmers to adopt these methodologies of raisin making. In Nashik district, about 3.0 lakhs MT grapes were processed for raisin making, of which 25-30 thousand MT grapes were processed by DOV method. These raisins fetch a market price of Rs 60 to 80 per kg.

Fig 2. Article on drying on vine for raisin making

b. Inclusion of pesticide residue testing under essential services

Grape is mainly exported to the countries like Netherland, Russia, UK, Bangladesh, Germany, United Arab Emeritus (UAE), Saudi Arab, Thailand, Hong Kong, Malaysia etc. During the year 2019-20, a total of 193,691 MT fresh grapes worth Rs. 217,687 lakhs were exported. Before export of any consignment, testing of grapes sample for residue is a prerequisite. After the imposition of nationwide lockdown, all the residue testing laboratories were closed and residue testing of grapes were stopped which hampered the grapes' export.

To facilitate the grape export, the Centre corresponded with Agriculture Commissioner, Government of Maharashtra and requested to include this pesticide residue testing under essential services category. Based on the request, Government of Maharashtra included pesticide residue testing under essential services. Besides, Centre also approached a few laboratories (NHRDF (Nashik) and Geochem, Mumbai) and convinced them to provide residue testing support to farmers and exporters under ***GrapeNet*** using a minimum number of essential staffs. Subsequently, other laboratories in Hyderabad also agreed to undertake residue testing. Thus, export of grapes was resumed after issuance of necessary guidelines by the government.

A total of 565 samples of grapes were tested during the lockdown period by nominated laboratories located in Nashik, Pune, Mumbai, and Hyderabad. This facilitated export of ~113 containers of grapes (1 container = approx. 15-18 MT, total 1695 MT) to the EU countries during the lockdown period.

c. Video for promotion of health benefit of grapes

To promote the consumption and sale of grape, a short video *"Eat Grapes and Stay Healthy"* was prepared in Marathi and Kannada. In this video (Fig 3), health benefit of grapes; specifically, to improve resistance against diseases were emphasized. The video has been uploaded on Centre's YouTube channel, website, Facebook post etc. besides circulating through various WhatsApp groups. This video has garnered good response and has been viewed by 610 (https://www.youtube.com/watch?v=G943ttdQMgk).

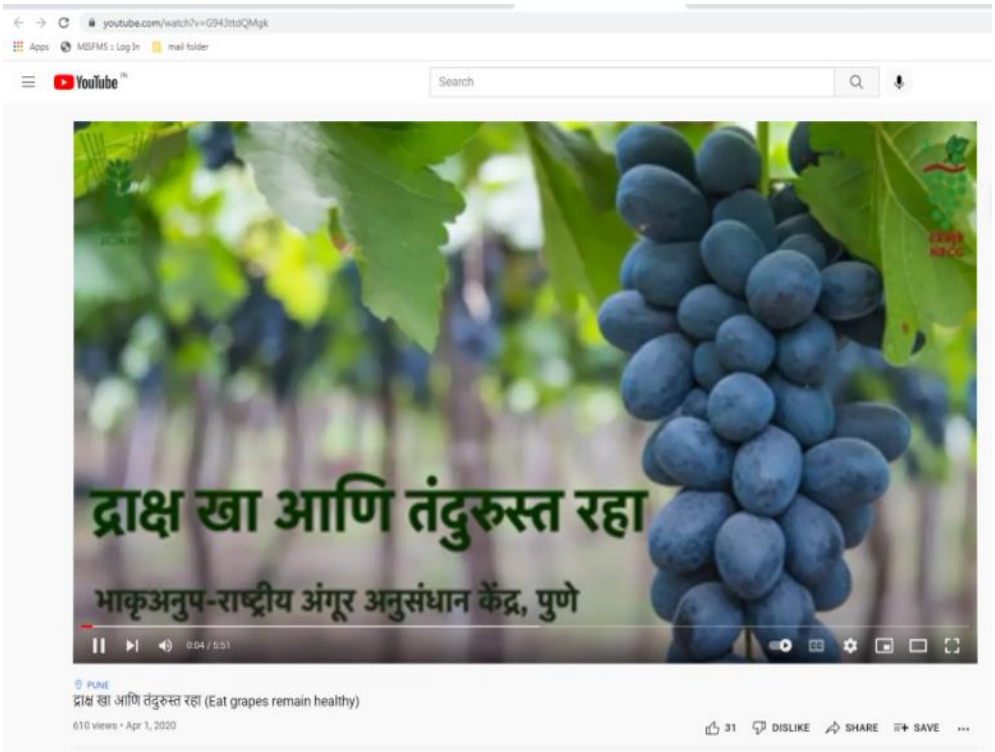


Fig 3. Video for promotion of health benefit of grapes

d. Grape advisories on package of practise

Every year, a team of scientists regularly visit the grape vineyards in different region during foundation and fruit pruning. The scientist advised the growers on different aspects of viticulture as well as problems faced by the growers in their vineyard. However, during lockdown field visits could not be taken up. Considering the importance of guidance during different growth stages, the advisories were prepared and disseminated among the growers on weekly basis using social media platforms.

e. Grape advisory for hailstorm affected vineyards

The unseasonal rains and hailstorm are common in some parts of Maharashtra and Karnataka. After forward pruning vines passes through vegetative growth phase and fruit bud differentiation. The rains during this stage affects the vine physiology, while hailstorm affects growth by damaging the shoots thereby hampering the fruit bud differentiation.

As it was difficult to have physical visit to vineyards, grape advisories were prepared and disseminated to the growers *via.,* Assistant Director (Horticulture), Jamkhandi, Govt. of Karnataka; Karnataka State Grape Growers Association; KVK, Bagalkot, Karnataka. The advisory to Maharashtra state was communicated to Agriculture Department of State Govt. in Marathi. During the period a total number of 98 advisories were provided and also uploaded on the Centre's website.


सकाळ अॅग्रोवन अॅग्रो विशेष गुरुवार, २ एप्रिल २०२० ६

द्राक्षबागेतील वेगवेगळ्या अवस्थांनुसार उपाययोजना

द्राक्ष सल्ला

डॉ. आर. जी. सोमकुंवर


सकाळ अॅग्रोवन फलोत्पादन गुरुवार, ३० एप्रिल २०२० ८

डॉ. आर. जी. सोमकुंवर, डॉ. सुरज साहा

अचानक वेली सुकत असलेल्या रिकटच्या बागेचे व्यवस्थापन

द्राक्ष सल्ला उपाययोजना अशिरा छाटणीच्या बागेतील व्यवस्थापन

सकाळ ॲग्रोवन फलोत्पादन गुरुवार, ९ एप्रिल २०२० ८

द्राक्षबागेतील अवस्थांनुसार व्यवस्थापन

द्राक्ष सल्ला

डॉ. आर. जी. सोमकुंवर, डॉ. ए. के. शर्मा, डॉ. डी. एस. यादव

सध्याच्या काळात बागेतील घडांच्या स्थितीनुसार व्यवस्थापन करणे आवश्यक आहे. ज्या बागेमध्ये खरड छाटणीची सुरुवात होत आहे, अशा ठिकाणी डोळे फुटण्याकरिता काही उपाययोजना महत्त्वाच्या असतील.

वाढणाऱ्या फूटीवर थ्रिप्सच्या प्रादुर्भावामुळे झालेले नुकसान.

मिलीबगचा प्रादुर्भाव झालेली नवीन फूट.

सकाळ ॲग्रोवन फलोत्पादन गुरुवार, २३ एप्रिल २०२०

खरडछाटणी दरम्यान रोग, किडीच्या प्रादुर्भावाकडे लक्ष द्या

द्राक्ष सल्ला

डॉ. आर. जी. सोमकुंवर, डॉ. एस. डी. रामटेके, डॉ. दीपेंद्रसिंह यादव, डॉ. सुजय साहा

सध्या वातावरणाचा विचार करता बागेमध्ये कमाल तापमानामध्ये वाढ आणि आर्द्रतेमध्ये घट होताना दिसून येते. सध्याच्या परिस्थितीत बागेत उपलब्ध वाढीच्या अवस्थांमध्ये येणाऱ्या अडचणी व त्यावरील उपाययोजनांची आजच्या लेखात माहिती घेत आहोत.

रिकटची बाग

जुनी बाग

Fig 4 Newspapers Articles

4. Dissemination of technologies

a. Newspaper articles

The growers were advised on different aspects of vineyard management through articles (79 nos.) in newspaper (*Agrowon*) and advisories were circulated through 22 *WhatsApp* groups. The newspaper articles mainly focus on management of grape vineyard during pandemic period. Articles were published to guide the growers on requirement of vines during different growth stages such as vineyard establishment, water and nutrient management during pruning, bunch development, insect, pest and disease management during critical growth sages of vineyard, raisin production with scientific procedures, etc. The detail list of articles published in newspaper is given in Fig 4 and Table 1.

b. YouTube videos

Considering the importance and wide reach of social media, a total of 19 YouTube videos were prepared and uploaded on Centre's YouTube channel. These videos were developed to address the need of the grape growers during different stages of crop growth. These videos have recorded more than 50654 views as on 30th Sep, 2021. The YouTube videos mainly covered

management of grape vineyards during establishment, grafting, bunch development, foundation and fruit pruning, hailstorm, etc. Nutrient and water management, growth regulator use, insect and disease management during critical growth stages were explained in these videos. The detail list of YouTube videos is presented in Fig 5 and Table 2.

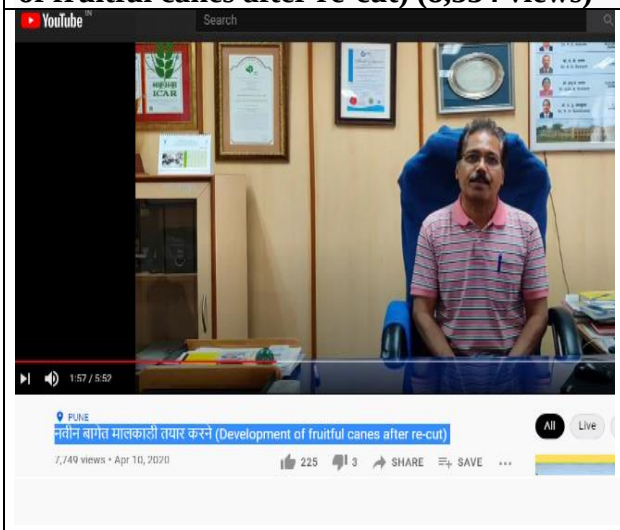
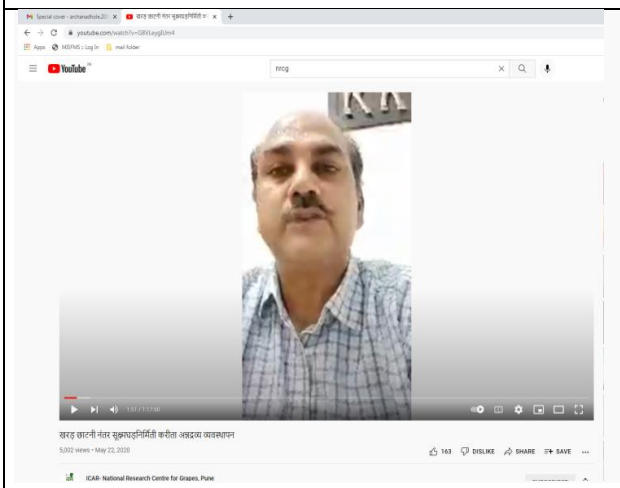
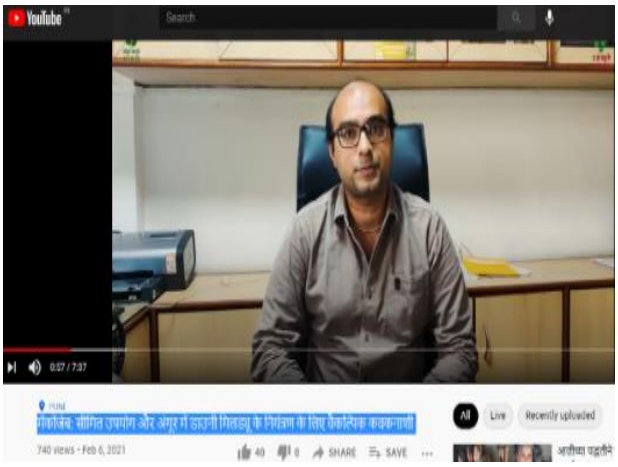
नवीन बागेत मालकाडी तयार करने (Development of fruitful canes after re-cut) (8,534 views)	**नाशिक क्षेत्र में अंगूर से बेदाना बनाने की सलाह (732 views)**
	
खरड़ छाटनी नंतर सूक्ष्मघड़निर्मिती करीता अन्नद्रव्य व्यवस्थापन (5002 views)	**मेंकोंजेब: सीमित उपयोग और अंगूर में डाउनी मिलड्यू के नियंत्रण के लिए वैकल्पिक कवकनाशी** (907 views)
	

Fig 5 Youtube Videos

c) Online lectures on different digital platform

The scientists of this Centre took efforts to guide the grape growers during different growth stages through online lectures. The lectures were delivered based on activities/ stages in the vineyard in particular grape growing region. The support of private organizations was also taken to reach the growers and 17 lectures were organised in public-private partnership mode. The detail list of Online lectures is presented in Table 3.

d. Seminars/Conferences/Meetings

During pandemic, grape growers' seminars which are held every year in four grape growing regions of Maharashtra, were organised in online mode. Besides seminar, several meetings to discuss different issues related to grape industry were also organised (Table 4).

1. **Webinar on "Export of grapes in 2021: Instructions for uses of authorized agrochemicals as per Annexure 5 of Residue Monitoring Plan"**

Dr A. K. Singh, DDG (Horticulture Science), ICAR chaired this conference, which was attended by 238 participants, pre-dominantly comprising the grape growers from various locations of Maharashtra and Karnataka states (Fig 6). Mr. Devendra Prasad, DGM (APEDA) had joined the panellists. The members of State Grape Growers' Association i.e., Maharashtra Rajya Draksh Bagaitdar Sangh (MRDBS) actively participated. The Centre updated the list of agrochemicals in Annexure 5 based on the field studies and provided the recommended dose of agrochemicals, usage instructions for managing diseases, insect pests, and physiological disorders, and suggested the compound-specific pre-harvest intervals (PHI) to minimize residues at harvest. Dr A.K. Singh, DDG (Horticulture Science) emphasized upon the importance of following the good agricultural practices in relation to pesticide applications in grape cultivation and congratulated the participants for developing an ideal residue control system in grapes in the country. He urged the participants to have confidence on ICAR-NRC for Grapes, Pune in providing technologies and recommendations for effective management of pesticide residues in grapes.

Fig 6. Webinar on "Export of grapes in 2021

2. Training on "Management and popularizing of grape cultivation under West Bengal conditions" under AMAAS- Tribal Sub-plan"

A training of twenty-eight tribal beneficiaries was held at HRDF, Taldangra, Bankura, West Bengal on 20.01.2021. Dr. Subrata Gupta, Additional Chief Secretary, F.P.I. & H. Govt. of West Bengal was the chief guest of the program. Dr. R. G. Somkuwar Director, ICAR-NRCG, Pune and Mr. Pradip Majumdar, Agricultural Advisor to the CM, Government of West Bengal, were the guests of-honour of the program (Fig 7). Other notable delegates were Sri S. Batabyal, Soho-Sabhadhipati, Bankura Zilla Parishad, B.D.O., Taldangra, In-charge B.C.K.V., campus Bankura (Chhatna), In charge C.A.D.C., K.V.K., Sonamukhi, D.D.H., Bankura and D.D.H., (HQ).

Fig 7. Training on "Management and popularizing of grape cultivation in West Bengal

5. Summary

During nationwide lockdown, ICAR-National Research Centre for Grapes, Pune has initiated mission mode program using digital platform to help the grape growers in better management of vineyards and export of fresh grapes. "*Drying On Vine"* technology for raisin making helped the farmers in Nashik district to convert about 3.0 lakhs MT grapes into raisin. Centre's efforts for inclusion of pesticide residue testing under essential services has benefited the exporter and grower in timely export of grapes. Further, timely dissemination of advisories on weekly basis for vineyard management via social media has also helped in better management of vineyards. During the period, total 19 YouTube videos, 17 online lectures, 9 Seminars/ Conferences/ Meetings were organized and 66 articles in newspaper were published for the benefit of stakeholders.

Table 1 List of articles published in newspapers

Sl. No.	Particulars	Date of publication
1	सद्यस्थितीत उद्भवलेल्या समस्या अन् उपाययोजना (Problems and solutions to current problems)	26/03/2020
2	बागेमध्येच उपलब्ध मण्यांपासून बेदाणे निर्मिती (Raisin production from bunches available in the garden itself)	29/03/2020
3	द्राक्षबागेतील वेगवेगळ्या अवस्थांनुसार उपाययोजना (Measures according to different conditions in the vineyard)	02/04/2020
4	द्राक्षबागेतील अवस्थांनुसार व्यवस्थापन (Management according to vineyard conditions)	09/04/2020
5	खरड छाटणीपूर्व तयारी (Preparations before foundation pruning)	16/04/2020
6	द्राक्ष उत्पादकांच्या अनुभवानुसार द्राक्षांचा वेल बेदाणे बनविण्याच्या तंत्रावर सुकवल्याने फायदा झाला (Experiences of grape growers benefitted from drying on vine technique of raisin making)	16/04/2020
7	खरड छाटणी दरम्यान रोग, किडीच्या प्रादुर्भावाकडे लक्ष द्या (Pay attention to the incidence of diseases and pests during foundation pruning)	23/04/2020
8	अचानक वेली सुकत असलेल्या रिकटच्या बागेचे व्यवस्थापन (Sudden vine drying in recut vineyard and its management)	30/04/2020
9	द्राक्षबागेत जाणवणाऱ्या समस्यावरील उपाययोजना (Remedies for the problems experienced in the vineyard)	07/05/2020
10	गारपीटीनंतर बागेतील उपाययोजना (Post-hailstorm measures in vineyard)	12/05/2020
11	जास्तीच्या ओलाव्यामुळे येणाऱ्या समस्यांवरील उपाययोजना (Remedies for problems caused by excess moisture)	22/05/2020
12	द्राक्षबागेतील स्ट्रोमॅशियम बारबॅटम खोड किडीचे नियंत्रण (Control of *Stromatium barbatum* stem borer in vineyards)	29/05/2020

Sl. No.	Particulars	Date of publication
13	वेलीचा वाढता जोम नियंत्रणात ठेवण्याकडे लक्ष द्या (Pay attention to control the growing vigour of the vine)	05/06/2020
14	उशिरा खरड छाटणीच्या बागेतील सूक्ष्म घडनिर्मिती (Fruit-bud differentiation in late pruned vineyards)	11/06/2020
15	पावसाळी वातावरणातील बागेचे व्यवस्थापन (Vineyard management in rainy climate)	18/06/2020
16	पावसाळी वातावरणातील द्राक्ष बागेतील व्यवस्थापन (Grape vineyard management in rainy climate)	26/06/2020
17	पावसाळी स्थितीतील द्राक्षबागेचे नियोजन (Vineyard management in rainy season)	09/07/2020
18	कॅनोपी व्यवस्थापनातून रोगनियंत्रण (Disease control through canopy management)	16/07/2020
19	काडी परिपक्वतेच्या अवस्थेतील रोग नियंत्रण (Disease control at cane maturity stage)	23/07/2020
20	काडी पक्वतेच्या अवस्थेतील अन्नद्रव्य व्यवस्थापन (Nutrient management in the cane maturing stage)	30/07/2020
21	पावसाळी वातावरणामध्ये द्राक्षबागेत येणाऱ्या अडचणींवरील उपाययोजना (Remedy for problems encountered in vineyards during rainy weather)	07/08/2020
22	अधिक आर्द्रतायुक्त वातावरणात द्राक्ष बागेत येणाऱ्या समस्या (Problems in the vineyard in a more humid environment)	13/08/2020
23	मुळे काळी पडणे, पानगळ या समस्यांकडे लक्ष द्या (Pay attention to the problems of blackening of the roots and leaf fall)	20/08/2020
24	द्राक्ष बागायतदारांच्या दृष्टीने 'अनेक्श्चर 5' महत्वाचेः डॉ. सिंग (Annexure-5 is important for grape growers: Dr. A. K. Singh)	24/08/2020
25	पावसाळ्यातील द्राक्षबागेचे व्यवस्थापन (Management of vineyards during the rainy season)	24/08/2020
26	द्राक्षबागेत कलम यशस्वी होण्यासाठी आवश्यक बाबी (The essentials for the success of grafting in the vineyard)	27/08/2020

Sl. No.	Particulars	Date of publication
27	काडीची परिपक्वता, पानगळ या समस्यांकडे लक्ष द्यावे (Pay attention to the issues of cane maturity and leaf fall)	10/09/2020
28	फळ छाटणीनंतरचे अन्नद्रव्य व्यवस्थापन (Nutrient management after fruit pruning)	15/10/2020
29	जातींच्या विकासासाठी जैव तंत्रज्ञानाचा वापर (Use of biotechnology for varietal development)	15/10/2020
30	डाऊनी, भूरी, करपा रोगांचे एकात्मिक नियंत्रण (Integrated control of downy mildew, powdery mildew and anthracnose diseases)	15/10/2020
31	निर्यातक्षम द्राक्षांमधील कीडनाशक अंश तपासणी (Pesticide residue monitoring in exportable grapes)	15/10/2020
32	खोड किडीचे प्रकार, एकात्मिक नियंत्रण (Types of stem borers, integrated control)	15/10/2020
33	दर्जेदार द्राक्षासाठी कॅनोपी व्यवस्थापन (Canopy management for quality grapes)	15/10/2020
34	बाजारपेठेसाठी गुणवत्ता (Quality for the market)	15/10/2020
35	गुणवत्तापूर्ण उत्पादनासाठी संजीवकांचा वापर (Use of bio-regulators for quality production)	15/10/2020
36	थंडीमध्ये वाढू शकते पिंक बेरीची समस्या (Cold weather may give rise to more pink berries)	11/12/2020
37	द्राक्ष बागांमध्ये भूरी, डाउनी वाढण्याची शक्यता (Likely to grow powdery mildew, downy mildew in vineyards)	17/12/2020
38	भुरी,डाऊनी मिल्ड्यू रोगाच्या नियंत्रणाकडे लक्ष द्यावे (Pay attention to the control of powdery, downy mildew disease)	24/12/2020
39	फळधारणा अवस्थेतील रोग व्यवस्थापन (Disease management in fruiting stage)	31/12/2020

Sl. No.	Particulars	Date of publication
40	मणी तडकण्यासह भुरी रोगाचा प्रादुभाव वाढेल (The incidence of powdery mildew will increase with beads cracking)	07/01/2021
41	मणी तडकण्याच्या समस्येसाठी राहा सतर्क (Be aware of the problem of bead cracking)	14/01/2021
42	घडाचा सुकवा टाळण्यासाठी उपाययोजना (Measures to prevent bunch drying)	04/02/2021
43	पानांच्या खालील बाजूस झालेली पांढऱ्या बुरशीची वाढ)The growth of white fungus on the underside of leaves)	12/02/2021
44	द्राक्ष बागेत रिकटची पूर्वतयारी (Preparation of rickettsia in the vineyard)	25/02/2021
45	नवीन बाग लगवडीचे नियोजन (Planning of new garden planting)	04/03/2021
46	खरडछाटणी:पूर्वतयारी आणि व्यवस्थापन (Foundation pruning: Preparation and Management)	11/03/2021
47	रिकट नंतरचे व्यवस्थापन (Management after re- cut)	18/03/2021
48	जुन्या बागेतील खरड छाटणीनंतरचे व्यवस्थापन (Old garden weed management after pruning)	25/03/2021
49	द्राक्ष बागेत खत, पाणी व्यवस्थापन (Fertilizer, water management in the vineyard)	01/04/2021
50	अवकाळी पवसानंतर उदभवलेल्या स्थितितिल व्यवस्थापन (Management in the aftermath of unseasonal rains)	15/04/2021
51	वाढत्या तापमानातील द्राक्ष बागेतील समस्या (Problems in the vineyard with rising temperatures)	22/04/2021
52	वादळी वारे, गारपीट झालेल्या स्थितीतील व्यवस्थापन (Hurricane, hail management)	29/04/2021

Sl. No.	Particulars	Date of publication
53	उत्तम सुक्ष्म घडनिर्मितीसाठी उपाययोजना (Measures for better bunch development/berry formation)	06/05/2021
54	सद्यस्थितीतील द्राक्ष बागेतील समस्या (Current problems in the vineyard)	13/05/2021
55	वादळी वारे, पाऊस स्थितीतील बागेचे व्यवस्थापन (Vineyard management during Stormy winds and rainy season)	21/05/2021
56	सूक्ष्मघडनिर्मिती के लिए पानी तथा अन्नद्रव्य व्यवस्थापन (Nutrient management during bunch development stage)	22/05/2021
57	सुक्ष्म घडनिर्मिती अवस्थेतील व्यवस्थापन (Vineyard management during berry development stage)	27/05/2021
58	खरड छाटणीनंतर येणाऱ्या करपा रोगाचे व्यवस्थापन (Management of diseases after foundation pruning)	28/05/2021
59	पावसाळ्याच्या सुरुवातीला भेडसावणाऱ्या किडींची समस्या (The problem of insects that attack early in the rainy season)	03/06/2021
60	द्राक्ष पिकातील अन्नद्रव्य , पाणी व्यवस्थापन (Nutrient and water management in vineyard)	03/06/2021
61	पाऊस झालेल्या बागेतील समस्यांचे निराकरण (Solving problems from rain affected vineyard)	17/06/2021
62	अंगुर उत्पादकों का आशास्थान -भाकृअनुप-राष्ट्रीय अंगूर अनुसंधान केन्द्र (Hope of grape growers- ICAR NRCG, Pune)	21/06/2021
63	उपलब्ध वातावरणीय ,वेलीच्या अवस्थेनुसार करावयाचे व्यवस्थापन (Management to be done according to available climatic conditions)	24/06/2021
64	वाढता ओलावा, आर्दतेमुळे निर्माण होणाऱ्या समस्या (Problems caused by increasing humidity)	01/07/2021
65	अन्नद्रव्यांच्या कमतरतेकडे लक्ष द्यावे (Attention should be paid to nutrient deficiencies)	01/07/2021

Sl. No.	Particulars	Date of publication
66	द्राक्ष बागेत खुंट रोपांचे व्यवस्थापन (Management of rootstock in the vineyard)	15/07/2021
67	द्राक्ष बागेतील डाऊनी मिल्ड्यू , डर्विशिया कडंबी खोडकिडीचे व्यवस्थापन (Management of Downey mildew and stem borer in vineyard)	20/07/2021
68	आगाप छाटणीचे बागेतील व्यवस्थापन (Management of foundation pruning)	22/07/2021
69	काडी परिपक्वता, आगाप छाटणी अवस्थेतील नियोजन (Management during cane maturity and foundation pruning)	05/08/2021
70	पूरग्रस्त भागातील द्राक्ष बागांसाठी व्यवस्थापन (Management of vineyards affected by flood)	15/08/2021
71	फळछाटणीचा कालावधी जवळ येतोय , काळजी घ्या (Take care for fruit pruning)	19/08/2021
72	ढगाळ वातावरणामुळे उद्भवणाऱ्या समस्यांकडे लक्ष द्या (Pay attention to the problems caused by cloudy weather)	29/08/2021
73	कलम करण्यासाठी योग्य कालावधी (Appropriate period for grafting)	03/09/2021
74	पाऊस, ढगाळ वातावरणामुळे उद्भवणार्या अडचणी, उपाययोजना (Problems and solutions due to rain, cloudy weather)	12/09/2021
75	हंगाम सुरू होण्यापूर्वी सिंचन यंत्रणा, खत व्यवस्थापनाचे नियोजन (Planning of irrigation system, fertilizer management before the start of the season)	16/09/2021
76	द्राक्षशेतीत हवी कृत्रिम बुद्धिमत्ता (Artificial intelligence required in vineyards)	23/09/2021
77	द्राक्षशेतीत परीक्षणानंतर व्यवस्थापनातून यश (Success from management after testing in vineyards)	23/09/2021
78	घड जिरण्याच्या, गोळीघड होण्याच्या समस्येवरील उपाययोजना (Solutions for bunch decay problem)	23/09/2021
79	फळछाटणी काळातील अडचणी अन उपाययोजना (Problems and solutions during fruit pruning)	30/09/2021

(Source: Problem based advise at https://nrcgrapes.icar.gov.in/)

Table 2. List of YouTube videos

Sl. No.	Particulars	Date of uploading	Number of views
1	सध्याच्या परिस्थितिवर द्राक्ष बागेतील उपाय योजना (Management of vineyards under current conditions)	01/04/2020	691
2	नाशिक क्षेत्र में अंगूर से बेदाना बनाने की सलाह (Counselling to make raisins from grapes in Nashik area**)**	08/04/2020	749
3	द्राक्ष बागेत खरड़ छाटनी नंतर उपाययोजना (Vineyard management after back pruning)	09/04/2020	1904
4	नवीन बागेत मालकाडी तयार करणे (Development of fruitful canes after re-cut)	10/04/2020	8618
5	द्राक्ष बागेतील किड व्यवस्थापन: नवीन व जूनी बाग (Pest management in grapes: new and old vineyards)	13/04/2020	3264
6	खरड़ छाटणीनंतर सूक्ष्मघड़निर्मिती करीता अन्नद्रव्य व्यवस्थापन (Nutrient management for microclimate after foundation pruning)	22/05/2020	4913
7	खरड़ छाटणी नंतर द्राक्षबागेत शाश्वत सूक्ष्म घड़निर्मिती (Surety of development of micro bunches in the vineyard after foundation pruning)	22/05/2020	9643
8	मेंकोंजेब: सीमित उपयोग और अंगूर में डाउनी मिलड्यू के नियंत्रण के लिए वैकल्पिक कवकनाशी (Mancozeb: Restricted use and alternative fungicide for the control of downy mildew in grapes)	06/02/2021	1063
9	बेदानासाठी उपयुक्त मांजरी किशमिश द्राक्ष्याच्या जातीविषयी बेदाना उत्पादक डॉ. व्यव्हारे यांचे अनुभव (Raisin maker Dr. Vyavhare's experience about Manjari Kishmish, grape variety suitable for raisins).	13/03/2021	1559

Sl. No.	Particulars	Date of uploading	Number of views
10	अंगूर में अप्रैल प्रुनिंग के तुरंत बाद और स्प्राउटिंग के समय कीट व्यवस्थापन (Pest management in grapes immediately after April pruning and during sprouting)	10/04/2021	515
11	ओलावृष्टि प्रभावित अंगूर के बागों का प्रबंधन (Management of hailstorm affected grape vineyard)	03/05/2021	844
12	अप्रैल प्रूनिंग के 20-40 दिनों बाद अंगूर के बागों में कीट प्रबंधन (Pest management in vineyards 20-40 days after April pruning)	13/05/2021	742
13	राष्ट्रीय द्राक्ष संशोधन केंद्राचे जैविक उत्पादन (Production of organic bio-agents at National Research Centre for Grapes)	20/05/2021	2602
14	पावसाळी वातावरणात सूक्ष्मघडनिर्मितीच्या उपाययोजना (Measures for bunch development under rainy weather)	25/05/2021	4084
15	सूक्ष्मघडनिर्मितीकरीता संजीवकांचा वापर: शंका व समाधान (Use of stimulants for micro-bunch formation: doubt and satisfaction)	27/05/2021	3384
16	अंगूर में स्ट्रोमेशियम बार्बेट्म नाम के तना छेदक का प्रबंधन (Management of stem borers called *Stromesium barbetum* in grapes)	01/06/2021	1078
17	अंगूर के बगीचों में खरपतवारों पर मिलीबग का प्रादुर्भाव और उसका अंगूर के पौधों पर असर (Infestation of mealy bugs on weeds in vineyards and its effect on grape plants)	02/06/2021	860
18	वर्तमान वर्षा की स्थिति में अंगूर में बैक्टीरियल स्पॉट और एन्थ्रेक्नोज का प्रबंधन (Management of bacterial spots and anthracnose in grapes under current rainfall conditions)	17/06/2021	3267
19	द्राक्षामधील दर्विशीया कडंबी लालरंगाच्या खोड़किड़ीचे व्यवस्थापन (अंगूर में लाल तना बेधक का प्रबंधन) (Management of red stem borer in grapes)	13/07/2021	874

(**Source:** https://www.youtube.com/channel/UCdoiHxfEEHJYZE_L1jjoKHQ/videos)

Table 3 List of online lectures

Sl. No.	Title of the lecture	Date
1.	Challenges facing grape growers in Covid-19 and possible solutions (कोविड१९ मध्ये द्राक्ष उत्पादकांसमोरील आव्हाने आणि संभावित उपाययोजना)	25/04/2020
2.	Guidance to grape growers of Dabholkar Prayog Pariwar (दाभोलकर प्रायोग परिवाराचे द्राक्ष उत्पादकांना मार्गदर्शन)	28/04/2020 to 29/04/2020
3.	Fruit bud differentiation and canopy management (कॅनोपी मॅनेजमेंट आणि शाश्वत घड निर्मिती)	01/05/2020
4.	Vineyards in corona situation and remedies (कोरोना स्थितीतील द्राक्षबागा आणि उपाययोजना)	07/05/2020
5.	Fruit bud differentiation through canopy management (कॅनोपी व्यवस्थापनातून शाश्वत घडनिर्मिती)	14/05/2020
6.	Nutrient and water management for fruit bud differentiation (शाश्वत घडनिर्मिती करिता अन्नद्रव्य व पाणी व्यवस्थापन)	14/05/2020
7.	Disease management after foundation pruning (खरड छाटणीनंतरचे रोग व्यवस्थापन)	16/05/2020
8.	Insect management after foundation pruning (खरड छाटणीनंतरचे कीड व्यवस्थापन)	16/05/2020
9.	Canopy management during maturity stage (परिपक्वता अवस्थेत छत व्यवस्थापन)	17/08/2020
10.	Lecture in crop seminar (पीक परिसंवादात व्याख्यान)	19/08/2020
11.	Guidance to grape growers of Abhinav Grape Growers Cooperative Society Limited, Junnar (अभिनव द्राक्ष उत्पादक सहकारी संस्था मर्यादित, जुन्नरचे द्राक्ष उत्पादकांना मार्गदर्शन)	10/09/2020
12.	Guiding grape growers in the training programme organized on digital platform (डिजिटल व्यासपीठावर आयोजित प्रशिक्षण कार्यक्रमात द्राक्ष उत्पादकांना मार्गदर्शन करताना)	28/09/2020

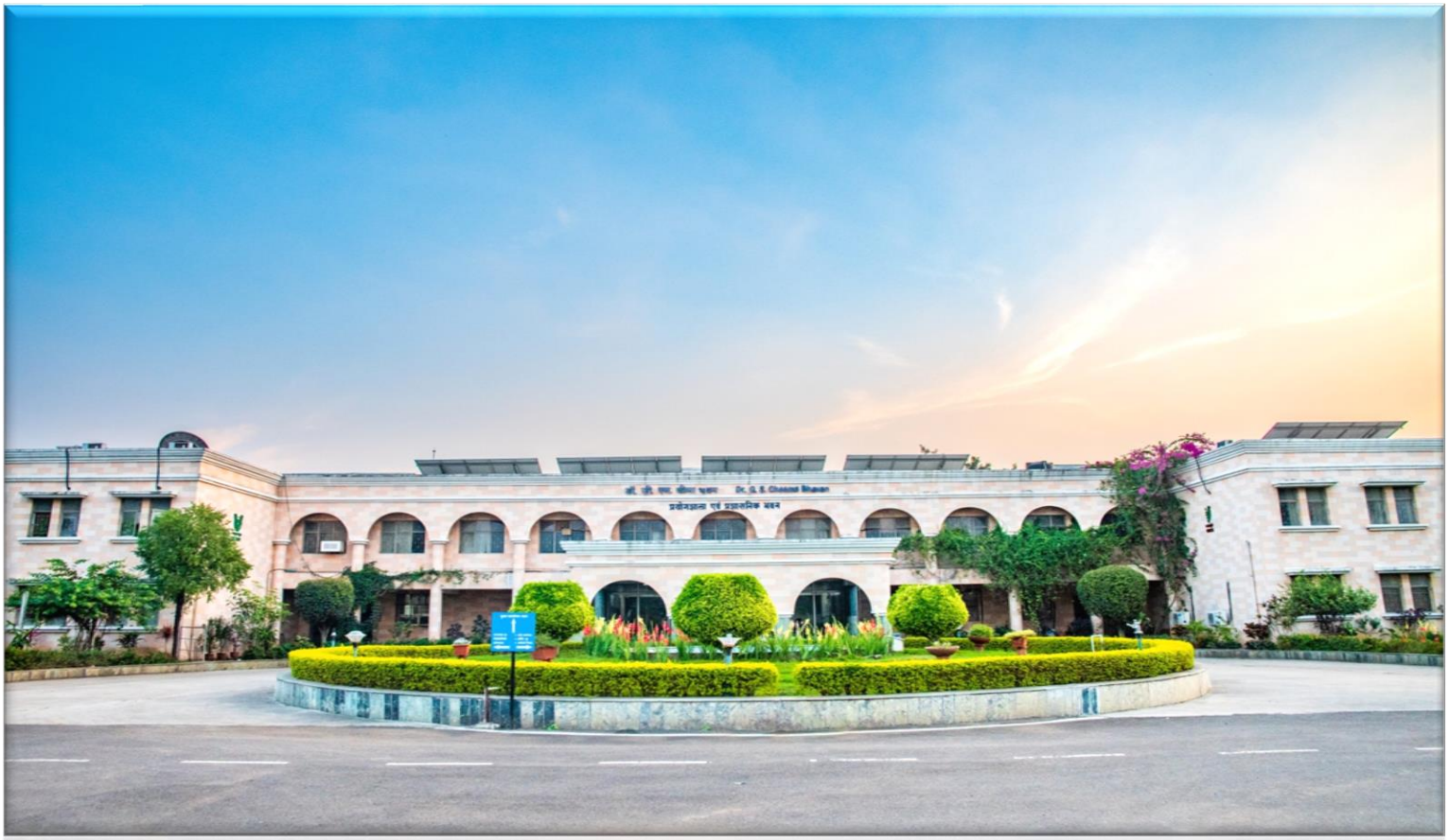
Sl. No.	Title of the lecture	Date
13.	Grape live sessions for grape growers of Maharashtra (महाराष्ट्रातील द्राक्ष उत्पादकांसाठी द्राक्ष थेट सत्र)	12/09/2020, 14/09/2020, 16/09/2020, 18/09/2020, 19/09/2020, 23/09/2020
14.	Guidance to grape growers on nutrient and water management in grapes in webinar session (वेबिनार सत्रात द्राक्ष उत्पादकांना द्राक्षातील पोषक तत्वे आणि पाणी व्यवस्थापन यावर मार्गदर्शन)	05/10/2020
15.	Guidance to grape growers in webinar sessions (वेबिनार सत्रात द्राक्ष उत्पादकांना मार्गदर्शन)	06/10/2020
16.	Guidance on 'Management of thrips in grapes' in online session for grape growers from Nasik, Sangli, Ahmednagar and Latur districts of Maharashtra (महाराष्ट्रातील नाशिक, सांगली, अहमदनगर आणि लातूर जिल्ह्यातील द्राक्ष उत्पादकांसाठी ऑनलाइन सत्रात 'द्राक्षांमध्ये थ्रिप्सचे व्यवस्थापन' या विषयावर मार्गदर्शन)	06/10/2020
17.	Guidance on 'Pesticide residue management in grapes' to grape growers from Nasik and Sangli districts of Maharashtra (महाराष्ट्रातील नाशिक आणि सांगली जिल्ह्यातील द्राक्ष उत्पादकांना 'द्राक्षांमधील कीटकनाशक अवशेष व्यवस्थापन' या विषयावर मार्गदर्शन)	07/10/2020 to 08/10/2020

(Source: Events at https://nrcgrapes.icar.gov.in/)

Table 4 List of Seminars/Conferences/Meetings

Sl. No.	Title of the conference / seminar/meeting	Duration
1	Meeting with members of grape grower's association to discuss present situation of grape vineyards.	11th May, 2020
2	Meeting on issues related to ban of 27 molecules and its impact on grape industry	20th May, 2020
3	Meeting with APEDA officials to promote export of grapes.	27th May, 2020
4	Webinar on Export of grapes in 2021: Instructions for uses of authorized agrochemicals as per Annexure 5 of Residue Monitoring Plan	20th August, 2020
5	Meeting with APEDA to discuss Annexure-9 (List of agrochemicals to be monitored)	26th August, 2020
6	Meeting of the office bearers of Maharashtra Rajya Draksha Bagaitdar Sangh (MRDBS), Pune; Grape Exporters' Association of India (GEAI), Nasik and Scientists of ICAR-NRCG under the Chairmanship of Dr A.K. Singh, Deputy Director General (Hort. Science), ICAR to discuss the issues/problems related to grape industry in Maharashtra	1st September, 2020
7	Virtual seminar on 'Production of Export Quality Raisins'	4th September, 2020
8	Web Conference on 'Vistas of Pesticide Applications in Grapes: Bio-efficacy and Residue Perspectives'	11th September, 2020
9	Meeting with grape grower's associations, grape exporters association, and APEDA	13th October, 2020
10	Training on "Management and popularizing of grape cultivation under West Bengal conditions" under AMAAS- Tribal Sub-plan" jointly organized by ICAR-NRCG, ICARNBAIM and Dept. of F. P. I. and H. Govt. of West Bengal	20th January, 2021

Sl. No.	Title of the conference / seminar/meeting	Duration
11	Interaction with the representatives of Maharashtra State Grape Growers' Association (MRDBS) and Grape Exporters' Association of India (GEAI) at ICAR-NRC Grapes, Pune	02nd February, 2021
12	One day training on 'Entrepreneurship Development in Manjari Medika grapes' under ABI project	16th February, 2021
13	Training on "Management of Paddy and Horticultural crops" under AMAAS. Tribal Sub Plan jointly organized by ICAR-NRCG, ICAR-NBAIM and KVK, Narayangaon (M.S.)	16th March, 2021
14	Online Charchasatra with grape growers on 'Vineyard management from pre-pruning preparation to berry development period'	7th September, 2021
15	Training on "Horticulture for livelihood security of farmers" under AMAAS (TSP) organized by ICAR-NRCG, Pune	18th September, 2021



भाकृअनुप-राष्ट्रीय अंगूर अनुसंधान केन्द्र

डाक पेटी संख्या ३, मांजरी फार्म डाकघर, सोलापूर रोड, पुणे - ४१२३०७, महाराष्ट्र, भारत

दूरभाष:०२०-२६९५६०००, फॅक्स: ०२०-२६९५६०९९, ई. मेल : nrcgrapes@gmail.com

ICAR-National Research Centre for Grapes

P.B. No. 3, Manjari Farm P.O, Solapur Road, Pune - 412 307, Maharashtra, India

Tel: +91-20-26956000 (EPABX), Fax: +91-20-26956099

E-Mail: director.nrcg@icar.gov.in Website: http://nrcgrapes.nic.in