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भाकृअनुप
ICAR

राअस्ट्रैप्रसं
NIASM

FARM COORDINATOR

... कृषि तकनीकी समन्वय पत्र

भाकृअनुप – राष्ट्रीय अजैविक स्ट्रैस प्रबंधन संस्थान

ICAR-NATIONAL INSTITUTE OF ABIOTIC STRESS MANAGEMENT

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FARM COORDINATOR

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भाकृअनुप ICAR

राअस्ट्रैप्रसं NIASM

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निदेशक के लेखनी से...

जनवरी 2021 फिर से नियासम परिवार और विशेषकर प्रक्षेत्र कर्मियों के लिए एक व्यस्त समय रहा। नया साल 'मॉडल फार्म' के विकास की प्रक्रिया में नए अवसर और नई पहल लेकर लाया।

कृषक-2021 ने नियासम परिसर में किसानों और प्रतिनिधियों के स्वागत के लिए एक मंच बन गया। यह संस्थान की अनुसंधान गतिविधियों विशेष रूप से फील्ड प्रोजेक्ट्स को दिखाने का अवसर रहा। इसने वैज्ञानिकों, तकनीकी, प्रशासनिक कर्मचारियों के साथ-साथ संविदा कर्मियों के बीच सही समन्वय का प्रदर्शन किया। इसके साथ ही, क्यूआर नियासम एक नई पहल के रूप में आकर्षण का एक बिंदु रहा। यह ऐप संस्थान संबंधी प्रभावी और आसान जानकारी हेतु एंड्रॉइड उपयोगकर्ताओं के लिए एक व्यक्तिगत मार्गदर्शिका के रूप में कार्य करता है। डेटाबेस में सुधार पूर्ण होने पर यह अधिक उपयोगी बन जाएगा।

इस महीने में मुख्य कृषि गतिविधियों में रबी फसलों का रखरखाव, बागों में चंदवा प्रबंधन और पौधों की सुरक्षा शामिल थी। अगले महीने के लिए खेतों की फसल की कटाई के लिए तैयार रहना है, आम में फल सेटिंग में सुधार के लिए किट नियंत्रण और कई अन्य लक्ष्य सामने है। मुझे पूरा यकीन है कि प्रक्षेत्र कर्मी हमेशा की तरह सभी लक्ष्यों को हासिल करने के लिए पूरे दिल से समर्पित रहेंगे।

मैं डॉ प्रवीण भि. तावरे, उनकी टीम और योगदानकर्ताओं को इस उपयोगी प्रकाशन को लाने के लिए बधाई देता हूं।

From Director's Desk...

The month of January 2021 was again a busy time for the NIASM family and especially for farm personnel. The new year brought new opportunities and new initiatives in the process of 'Model Farm' development.

KRUSHAK-2021 created the platform to welcome farmers and delegates at NIASM campus. It was an opportunity to showcase the research activities of the institute especially field projects. This exhibited the true coordination between scientists, technical, administrative staff along with contractual personnel. Simultaneously, a new initiative in the form of 'QR_NIASM', was also a point of attraction. This app acts as a personal guide for Android users for effective and easy access to information of the Institute. The improvement in database will make it full proof and more useful.

The main farm activities this month included maintenance of rabi crops, canopy management and plant protection in orchards. The targets for next month are to stay prepared for harvesting of field crops, IPM for improving fruit set in mango and many more. I am quite sure that the farm staff will devote whole heartedly to achieve all the targets ahead as usual.

I congratulate Dr Pravin B. Taware, his team & contributors for bringing out this useful publication.

दिसम्बर / January 31, 2021

हिमांशु पाठक / Himanshu Pathak

Contents

Rabi Sorghum var. Vasudha

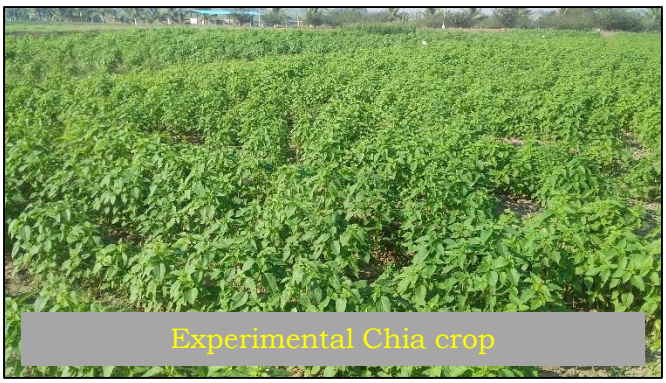
Maintenance of field crops: All the *rabi* crops (wheat, chickpea, and maize) were at grand growth stage and required strict attention for irrigation and weed management. There was a canal closure period for 15-days but managed the irrigation from water in south pond (Manas). Weed management in general and experimental fields was managed through hand weeding.

Maintenance of orchards: Canopy management, plant protection and irrigation were important as per the targets fixed.

- After hard pruning in Karonda, vigorous shoot growth was.
- In dragon fruit alternate plants in each row were headed back and canopy support windows were placed at top to initiate trial on canopy density studies.
- Sweet orange and acid lime: removal of diseased and dried branches was completed to start new fruiting season.
- In Mango flowering was reported and three sprays for protection from hoppers and powdery mildew were taken up.
- Berry thinning in grape was carried out manually. Gibberellic acid (GA3) 50 ppm was carried to loosen bunches & enhance berry growth in Thomson seedless grapes. Spraying of Myclobutanil 0.5 g/L along with 0-52-34 @ 5g/L was carried out to control powdery mildew. Single spray of Trichoderma 5ml/L was carried pot to reduce post harvest losses.
- Date Palm side shoots and dried leaves at bottom were removed.
- Preparations for Krishak-2021: Looking in to this program, proper cleanliness at all around the campus was ensured by through look for roughing of weeds and its disposal. All the field boards were cleaned and fixed with new flex for displaying latest information.
- Garden maintenance: As an usual practices all the gardens at buildings and roadside plantations were taken care of through training and pruning operations. Watering of avenue and peripheral plantations was achieved with the help of tanker.


Expermental Wheat crop


Experimental Chickpea crop


Experimental Chia crop


Canopy Management in Dragon fruit


Pest management in Mango


Karonda: Canopy management

Weather Summary of January 2021 at ICAR-NIASM

Mr. Sunil V. Potekar & Mr. R.N. Singh

The long period average (LPA) of January rainfall and average temperature at Baramati is 0.6 mm and 22.0 °C, respectively. The details of weather during the January 2021 has been listed in Table 1 and depicted in following figure.

Table 1. Summary of weather variables recorded during January, 2021.

Weather Parameters	Week				Monthly	Max.	Min.
	1st	2nd	3rd	4th			
T Max (°C)	28.2	30.0	31.7	32.4	30.7	33.2	25.2
T Min (°C)	17.7	18.0	16.8	14.8	16.7	20.9	14.4
T Avg (°C)	23.0	24.0	24.3	23.6	23.7	24.9	21.8
RH Mean (%)	73	68	63	59	65	84	53
WS (km/h)	5.6	4.6	4.9	3.5	4.8	7.8	3.2
BSS (h)	3.4	6.0	7.1	8.5	6.3	9.0	0.0
Total PE (mm)	22.4	25.5	30.8	32.7	125.3	5.2	1.6
Total Rain (mm)	10.6	0.0	0.0	0.0	10.6	10.6	0.0

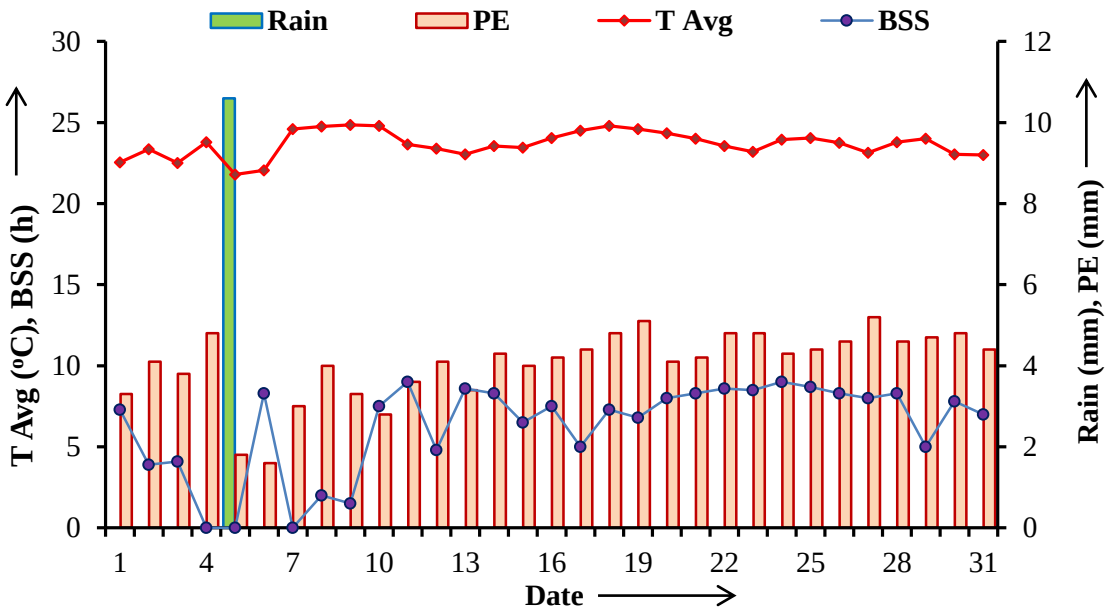
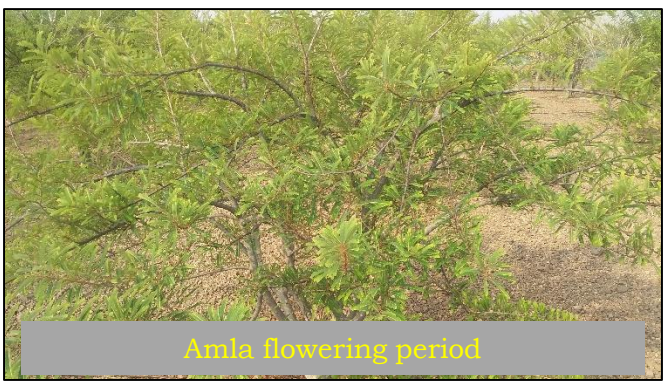


Fig . Variations of daily rainfall (Rain), pan evaporation (PE), mean temperature (T_{Avg}) and bright sunshine hours (BSS) during January, 2021 at ICAR-NIASM Baramati.

Tamarind tree with fruits



Amla flowering period

Rabi crops maintenance: Some *rabi* crops like sorghum and chickpea will reach maturity and these will be harvested during February. While wheat, maize, sunflower, etc. will require maintenance through irrigation and weed management.

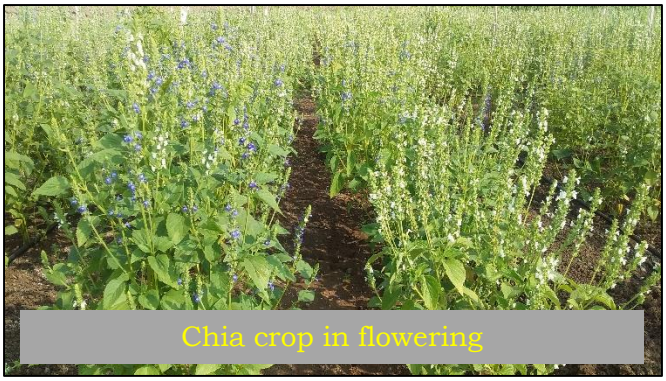
Canopy management in orchards will be continued.

- Pruning in custard apple will be completed in first week of February followed by fertilizer application.
- Light pruning to remove excess shoots in dragon fruit is to be completed within first fortnight and these are to be planted in nursery for rooted cutting preparation.
- Spraying of biological control agents like Trichoderma and Pseudomonas will be done in grape, pomegranate, mango, sweet orange and custard apple as IPM practice.
- Harvesting in grape and sapota will be initiated and it will be disposed through standard procedure.

Irrigation management: Testing of new irrigation project is getting delayed due to pending works from Dept. of Irrigation. Follow up for its commissioning is priority work to tackle water scares situation during canal closure period. Meanwhile care will be taken to operate old system for flood irrigation as well as filling up the water storage tanks for use in orchards and other plantations. As soon as the testing of new system is done, sprinkler irrigation systems will be planned for irrigation in south farm fields.

Plant protection: Important pests and diseases to be managed during February 2021 are fruit borer in pomegranate, hoppers and powdery mildew in mango, mealy bug in grapes, bacterial infections in citrus and leaf eating caterpillar in drumstick. Prophylactic and need based spraying activities will be taken up.

Landscape garden maintenance : Includes training pruning of ornamental plants to give desired shape. Lawn maintenance by mowing, fertilizer application and weed management.


Chia crop in flowering


Mango abundant flowering


Pomegranate fruiting stage


Grape maturity stage

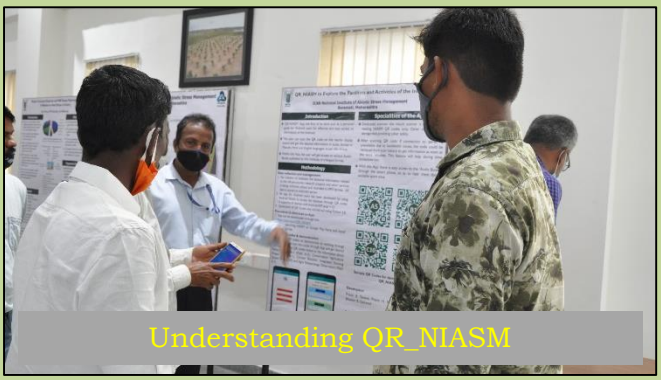

Pruning in Custard apple


Training of new dragon fruit plants

Edaphic stress in the form of hard rocky base with shallow soil depth and water scarcity stress are important challenges that influence the crop growth at NIASM campus. To tackle these situations farm management is working on following measure;

- Improving organic carbon content of soil by application of organic manures and cultivating green manure crops at intervals.
- Use of hygroscopic polymers to improve water holding capacity.
- Use of plastic mulch in orchards to cover plant basins.
- Developing micro-irrigation systems for field crops to replace flood irrigation.
- Avoid moisture depletion through canopy management.
- Use of growth regulators or agrochemicals to make efficient use of available moisture.
- Increasing number of water storage ponds.
- Developing drainage water collection system for irrigation purpose.
- risk through 'bahar treatment' and selecting safe window for production phase.
- And last but not the least, follow-up for early commissioning of new lift irrigation project.

Photos Collection: Farmers' Visit during KRUSHAK 2021

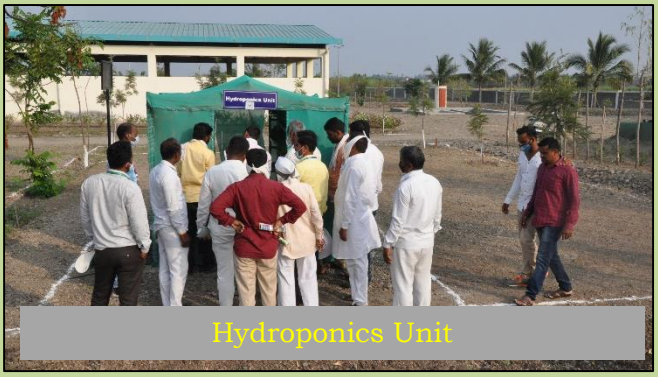

Understanding QR_NIASM


Understanding Field Research


Dragon Fruit Field Visit


Visit to Livestock Unit


Conservation Agriculture


Hydroponics Unit

Role of Tillage Operations in Farm Management (Part-II)

Primary and secondary tillage:

Primary tillage is the process of opening up soil after harvesting the previous crop and burying crop residue by inversion and mixing it into the tilled layer. The implements commonly used for primary tillage are:

- Mould board, chisel and wide sweep ploughs
- Disk tillers
- Disk ploughs and disc harrows
- Rotary tillers

The secondary tillage pulverizes the soil. It levels and consolidates the soil to close air pockets, kills weeds and helps conserve soil moisture. The tools of secondary tillage include:

- Disk and tine harrows
- Field conditioners and cultivators
- Roller packers and roller harrows
- Rotary hoes
- Disc tillers
- Row crop cultivators & weed control in implements

Types of tillage

Tillage can be classified into conventional, minimum and no till or zero tillage according to the number of operations involved and equipment used.

Conventional tillage includes primary tillage and a few operations of Secondary tillage. The number of operations varies with crop and soil type. Conventional tillage involves:

- Pre-ploughing operations (e.g. shredding or disking crop Residue)
- Ploughing to pulverize soil
- Disc harrowing or field cultivating
- Harrowing with tooth type harrows
- Using one or multi row cultivators depending on the crop, area and weed problems
- Ridging or bedding to shape the soil

Minimum tillage, also known as optimum, reduced, or economy tillage, is based on the principles that less energy and labour inputs bring higher returns; crop production does not depend on preparing a 'clean field' i.e. no previous crop residue; and that soil should be disturbed as little as possible. Minimum tillage practices include:

- Maintaining crop residue on the surface to conserve moisture and build soil organic matter
- Reducing the number of passes over a field
- Eliminating pre-plowing
- Passing one instead of several times with secondary tillage equipment such as disk or spring tooth harrows
- Tilling strips for planting and leaving inter-row space under residue
- Use of herbicides to eradicate weeds.

No Till or Zero Tilage is described as being the opposite of conventional tillage and the most radical of minimum tillage systems. It supports the principle of minimum tillage by reducing it to only one operation, that of opening the soil for the seed at planting.

Primari Tillage: Ploughing

Preparation of ridges & furrows

QR_NIASM to Explore the Facilities and Activities of the Institute

Introduction:

- 'QR-NIASM' App, the first of its kind, acts as a personal guide for Android users for effective and easy access to information of the Institute.
- The user can scan the QR code on the nearby display board and get the desired information in audio format in Marathi, Hindi and English languages, as per the choice.
- Within this App, the user will get access to various Audio Books published by this institute, in trilingual format.

Data collection and management:

1. For creation of database, the technical information related to the infrastructures, research projects and other services is being collected, edited and recorded in MP3 format. All data is stored on institute's server.
2. An app for Android users has been developed by using Android Studio. It supports all devices with Android API level above 21.
3. Generation of QR Codes was carried out using Python 3.8.

Procedure to download an App:

1. App can be downloaded through link- http://niam.res.in/QR_NIASM/
2. Or by searching NIASM on Google Play Store and install app first in list.

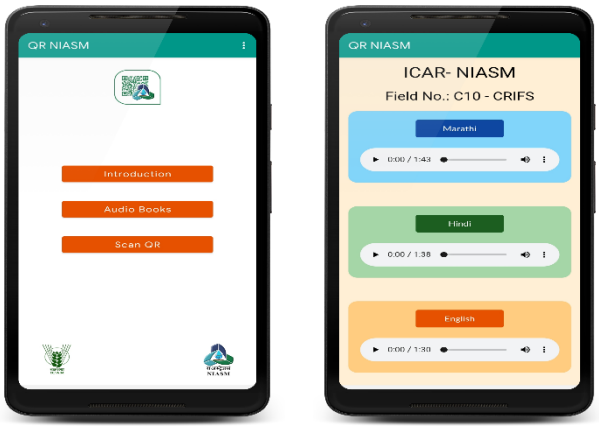
Sample QR codes & demonstration

Four sample QR codes to demonstrate its working through 'QR_NIASM'. Just scan the codes through App and get desired information. These QR codes linked to the information about Fishery Wet Lab-1 (Field A-5), Conservation Agriculture Project (Field B-1), Climate Resilient Integrated Farming System (Field C-10) and Agro Meteorology Observatory (Field D-7).

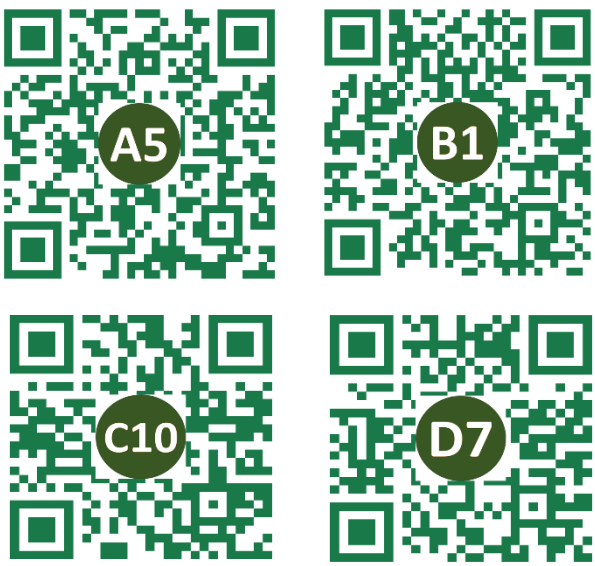
QR_NIASM Concept Launch

Specialities of the App:

- Dedicated scanner- the inbuilt scanner is restricted for reading NIASM QR codes only. Other codes will be disregarded providing cyber safety.
- After scanning QR code if connection to server is unavailable due to bandwidth issues, the code could be retrieved from scan history to get information as soon as the issue resolves. This feature will help during time limitations too.
- With this App there is easy access to the 'Audio Books' through the smart phone, so as to hear them during available spare time.



An interface of the App QR_NIASM



Sample QR Codes for demonstration through QR_NIASM

Developers:

Pravin B. Taware, Pravin H. More, Shon P. Taware and Bhaskar B. Gaikwad

प्रगति के पथ पर

कृषक-2021 के दौरान आगंतुकों से बहुत प्रशंसा मिली जिसने अनुसंधान फार्म को और अधिक मूल्यवान बनाने की जिम्मेदारी को बढ़ा दिया है। और हमें कुछ सुझावों पर भी काम करने की जरूरत है। समन्वय सहयोगियों को बढ़ाते हुए कृषि कार्यों को अधिक कुशल और पारदर्शी बनाया जाना चाहिए।

नियासम परिसर में सभी बागान, छाया और परिधीय वृक्ष, कम जल धारण क्षमता वाली कठोर बेसाल्टिक चट्टान के ऊपर उथली मिट्टी पर खड़े हैं। इन परिस्थितियों में पौधों की वृद्धि के लिए प्राथमिक आवश्यकता सिंचाई जल की पर्याप्त आपूर्ति है। फरवरी से, जैसे-जैसे तापमान बढ़ने लगता है, यह पौधों के जीवित रहने के लिए अधिक महत्वपूर्ण हो जाता है। इसको देखते हुए आवश्यकता के अनुसार पानी की सुनिश्चित आपूर्ति होनी चाहिए। इस दृष्टि से नई लिफ्ट सिंचाई परियोजना के चालू होने के लिए अनुवर्ती कार्रवाई की बहुत आवश्यकता है।

संस्थान द्वारा क्षेत्र प्रयोगों के बारे में जानकारी प्रदान करने के लिए 'क्यूआर नियासम' ऐप के माध्यम से एक नई पहल शुरू की गई है। अब डेटाबेस में सुधार के लिए सभी क्षेत्र प्रयोग के लिए लक्ष्य जानकारी एकत्र करने और संकलित करने के लिए प्रयासों की आवश्यकता है। आगंतुकों के लिए स्व-व्याख्या करने के लिए सभी फील्ड बोर्डों पर क्यूआर कोड को लगाने की योजना बनाई जा रही है।

Plan For Progress

Lot of appreciation received from the visitors during KRISHAK-2021 that increased the responsibility to make the Research Farm more valuable. And we need to work on some suggestions too. Farm operations to be made more efficient and transparent while increasing coordination colleagues.

All the orchards, avenue and peripheral plantations at NIASM campus stand on shallow soil on top of hard basaltic rock with low water holding capacity. Primary need for plants' growth under these conditions is sufficient supply of irrigation water. From February onwards, as the temperature starts rising, it becomes more important for survival of the plants. Looking in to this the assured supply of water as per requirement is must. From this point of view follow up for commissioning of new lift irrigation project is much required.

A new initiative through 'QR_NIASM' app to provide information about field experiments has been launched by the institute. Now efforts are required to collect and compile target information for all field experimentation to improve the database. It is being planned to fix QR code on all field boards to make self-explanatory for the visitors.

View through avenue plantations


Roadside flowering plants

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