ACHIEVEMENTS

AWARDS AND RECOGNITIONS

Achievements of Centre:

- Conferred ICAR "**Chaudhary Devi Lal Outstanding All India Coordinated Research Project Award 2016"** under ICAR-AICRP (Fruits) programme as **"Best Centre"** on ICAR Foundation Day.

Indian Council of Agricultural Research

Certificate

CHAUDHARY DEVI LAL OUTSTANDING ALL INDIA COORDINATED RESEARCH PROJECT AWARD 2016

(For Best All India Coordinated Research Project)

is presented to

Gandevi under Navsari Agricultural University, Gujarat

under All India Coordinated Research Project on Fruits

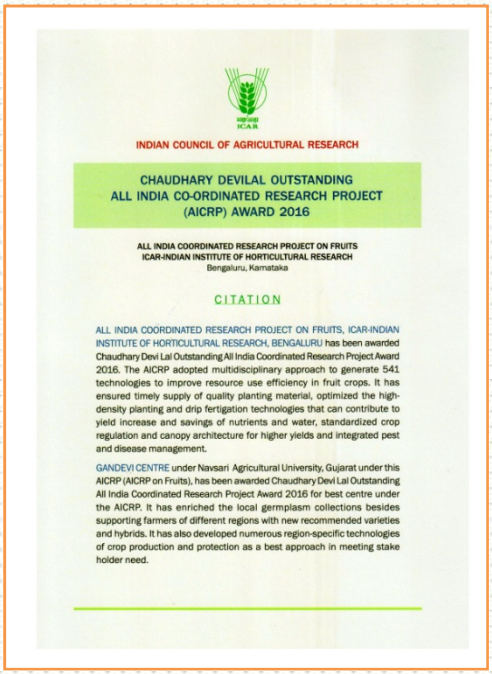
ICAR-Indian Institute of Horticultural Research, Hessaraghatta Lake Post, Bengaluru, Karnataka

16 July, 2017
New Delhi

(T. Mohapatra)
Secretary (DARE) &
Director General (ICAR)

(Radha Mohan Singh)
Minister of Agriculture & Farmers Welfare
Govt. of India

Award Ceremony



INDIAN COUNCIL OF AGRICULTURAL RESEARCH

CHAUDHARY DEVILAL OUTSTANDING ALL INDIA CO-ORDINATED RESEARCH PROJECT (AICRP) AWARD 2016

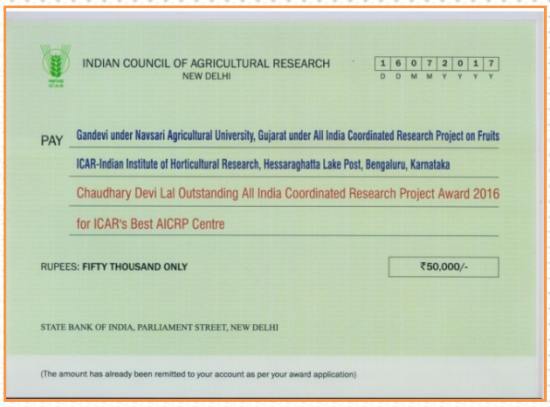
ALL INDIA COORDINATED RESEARCH PROJECT ON FRUITS
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH
Bengaluru, Karnataka

CITATION

ALL INDIA COORDINATED RESEARCH PROJECT ON FRUITS, ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH, BENGALURU has been awarded Chaudhary Devi Lal Outstanding All India Coordinated Research Project Award 2016. The AICRP adopted multidisciplinary approach to generate 541 technologies to improve resource use efficiency in fruit crops. It has ensured timely supply of quality planting material, optimized the high-density planting and drip fertigation technologies that can contribute to yield increase and savings of nutrients and water, standardized crop regulation and canopy architecture for higher yields and integrated pest and disease management.

GANDEVI CENTRE under Navsari Agricultural University, Gujarat under this AICRP (AICRP on Fruits), has been awarded Chaudhary Devi Lal Outstanding All India Coordinated Research Project Award 2016 for best centre under the AICRP. It has enriched the local germplasm collections besides supporting farmers of different regions with new recommended varieties and hybrids. It has also developed numerous region-specific technologies of crop production and protection as a best approach in meeting stake holder need.

Citation



INDIAN COUNCIL OF AGRICULTURAL RESEARCH
NEW DELHI

16 07 2017
D D M M Y Y Y Y

PAY Gandevi under Navsari Agricultural University, Gujarat under All India Coordinated Research Project on Fruits

ICAR-Indian Institute of Horticultural Research, Hessaraghatta Lake Post, Bengaluru, Karnataka

Chaudhary Devi Lal Outstanding All India Coordinated Research Project Award 2016

for ICAR's Best AICRP Centre

RUPEES: FIFTY THOUSAND ONLY ₹50,000/-

STATE BANK OF INDIA, PARLIAMENT STREET, NEW DELHI

(The amount has already been remitted to your account as per your award application)

Cash Price

- **Gandevi centre** conferred **"Second Position for Excellent Performance in 2022-24 under ICAR-AICRP (Fruits)"** during 12th Group Discussion Meeting of ICAR-All India Coordinated Research Project on Fruits held at Bihar Agricultural University during 11th to 14th February, 2025.


All India Coordinated Research Project on Fruits
Indian Council of Agricultural Research

CERTIFICATE

Gandevi Centre has been conferred with **Second Position** for Excellent performance in the year 2023-24, with this certificate presented during the XII Group Discussion of ICAR-AICRP on Fruits at Bihar Agricultural University, Sabour, Bihar, from February 11th to 14th, 2025.

Dr. Prakash Patil
Project Coordinator (Fruits)

Dr. V. B. Patel
Assistant Director General (F&PC)

Prof. Sanjay Kumar Singh
Deputy Director General (Hort. Sci.)

Cetificate

Dr. Prakash Patil, Project Coordinator, ICAR-IIHR, Bengaluru, Dr. P.C. Tripathi, HQ-Hort. Sci., ICAR, New Delhi and Dr. Subash Chander, ICAR Invitees awarding ' Second Position Performance Award 2023-24'

Dr. Z. P. Patel, Hon'ble Vice-Chancellor, NAU, Navsari along with Dr. Lalit Mahatama, Associate Director of Research congratuating the team for 'Performance Award 2023-24'

- **Gandevi centre** received **"First Position for Outstanding Performance in the Year 2022-23"** in ICAR-AICRP (Fruits) during 11th Group Discussion Meeting of ICAR-All India Coordinated Research Project on Fruits held at NAU, Navsari during 22nd to 25th January, 2024.

All India Coordinated Research Project on Fruits
Indian Council of Agricultural Research

CERTIFICATE

GANDEVI (NAU) Centre has been conferred with **First Position** for outstanding performance in the year 2022-23, with this certificate presented during the XI Group Discussion of ICAR-AICRP on Fruits at Navsari Agricultural University, Navsari, Gujarat, from January 22nd to 25th, 2024.

Dr. Prakash Patil
Project Coordinator (Fruits)

Dr. V. B. Patel
Assistant Director General (F&PC)

Prof. Sanjay Kumar Singh
Deputy Director General (Hort. Sci.)

Cetificate

Dr. Sanjay Kumar Singh, DDG (Hort. Sci.), ICAR, New Delhi; Dr. Prakash Patil, Project Coordinator, ICAR-IIHR, Bengaluru and Dr. T. R. Ahlawat, NAU, Navsari awarding ' First Position Performance Award 2022-23'

- Awarded as **"Best Centre" of ICAR-AICRP (Fruits) for 2022** in 10th Group Discussion Meeting of ICAR-AICRP (Fruits) held in Virtual Mode during 28th February to 3rd March, 2023.

ICAR- All India Coordinated Research Project on Fruits
Indian Council of Agricultural Research

Certificate of Appreciation

Best Centre 2022

This is to certify that..... Gandevi Centre (NAU) ..... has been conferred with the **Best Centre for the year 2022** during the X Group Discussion of ICAR-AICRP on Fruits held in virtual mode from 28th February to 03rd March 2023.

Dr. Prakash Patil
Project Coordinator (Fruits)

Dr. Anand Kumar Singh
Deputy Director General (Hort. Sci.)

Certificate

Dr. Z. P. Patel, Hon'ble Vice-Chancellor, NAU, Navsari along with Dr. T. R. Ahlawat, Director of Research and Dr. V. R. Naik, ADR congratuating the team for 'BEST CENTRE AWARD 2022'

- Awarded as **"Best Centre" of ICAR-AICRP (Fruits) for 2021** in 9th Group Discussion Meeting of ICAR-AICRP (Fruits) held in Virtual Mode during 8th to 11th March, 2022.


ICAR- All India Coordinated Research Project on Fruits
Indian Council of Agricultural Research

BEST CENTRE AWARDS

Best Centre Award 2021

This is to certify that Gandevi Centre (NAU) has been awarded as the Best Centre Award for the year 2021 during the IX Group Discussion of ICAR-AICRP on Fruits held in virtual mode from 8th to 11th March 2022.

Dr. Prakash Patil
Project Coordinator (Fruits)

Dr. Anand Kumar Singh
Deputy Director General (Hort. Sci.)

Certificate

Dr. Z. P. Patel, Hon'ble Vice-Chancellor, NAU, Navsari congratuating the team for "Best Centre Award 2021" and "Award of Excellence"

- Recognized as **"Award of Excellence"** for 'Linking Technology Development and Transfer for 2021" in 9th Group Discussion Meeting of ICAR-AICRP (Fruits) held in Virtual Mode during 8th to 11th March, 2022.

Certificate

- Awarded as **"Best Centre" of ICAR-AICRP (Fruits) for 2020** in 8th Group Discussion Meeting of ICAR-AICRP (Fruits) held in Virtual Mode during 3rd to 6th March, 2021.

Certificate

- Awarded as **"Best Centre" of ICAR-AICRP (Fruits)** for 2016 in 3rd Group Discussion Meeting of ICAR-AICRP (Fruits) held at PAU, Ludhiana (Punjab) during 3rd to 6th March, 2016.

INDIAN COUNCIL OF AGRICULTURAL RESEARCH, NEW DELHI
ICAR-ALL INDIA COORDINATED RESEARCH PROJECT ON FRUITS

AWARD

This is to certify that
Gandevi centre (Navasari Agricultural University)
has been awarded as the best centre during the 3rd Group
Discussion of ICAR-AICRP on Fruits held
from 3rd to 6th March 2016.

Dr. Prakash Patil
Project Coordinator (Fruits)

Dr. N. K. Krishna Kumar
Deputy Director General (Hort. Sci.)
ICAR- New Delhi

Certificate

Dr. N. K. Krishna Kumar, DDG (Hort. Sci.), ICAR, New Delhi and Dr. Prakash Patil, Project Coordinator, ICAR-AICRP on Fruits, IIHR, Bengaluru awarding 'BEST CENTRE AWARD 2016'

Milestone of Faculty:

Dr. Z. P. PATEL
VICE CHANCELLOR
NAVSARI AGRICULRTURAL UNIVERSITY
NAVSARI – 396 450, GUJARAT

Dr. Z. P. Patel, Hon'ble Vice Chancellor, Navsari Agricultural University, Navsari had started his service in AICRP (Tropical Fruits) as Jr. Entomologist on July, 1990 at Gandevi. During his tenure, he surveyed and collected the different insect pest species of banana and sapota and their natural enemies got identified from CIE, London, UK first time in the region. As a landmark, he firstly reported an exotic pest, sapota seed borer (*Trymalitis margarias* Meyrick) from Dahanu area of Maharashtra in year 2000 under AICRP (TF) survey work. Also, first time reported midrib folder (leaf folder), *Banisia myrsusales elearalis* (Walker) damaging the leaves of *Khirnee,* a rootstocks (*Manilkara hexandra*) of sapota in nursery in South Gujarat area. As well, he noted the incidence of pseudostem weevil in banana first time in South Gujarat.

He had first time prepared pest calendar in banana and sapota based on status of insect pests of different regions of India. The design was appreciated at National level and is an outlook for new researchers. He had promoted as Associate Research Scientist (Ento.) during 1997 and later selected as professor in 2008. In AICRP (TF) scheme, he had served about 18 years, nearly half of University service and achieved the utmost position as Vice Chancellor, NAU, Navsari in October, 2020. During his term, he had recommended plant protection technology for bud boring pests of sapota, which was mostly adopted by growers in Gujarat.

He popularized eco-friendly and low cost fruit fly management technology of "NAUROJI STONEHOUSE FRUIT FLY TRAP" in fruit crops. The successful interventions of this technology was highlighted in 'INCENTIVISING AGRICULTURE RKVY INITIATIVES' published by Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India during 2012 for benefitting farmers community.

Receiving **"Sardar Patel Agricultural Research Award"** in 2000 by the then **Hon. Chief Minister of Gujarat, Shri Keshubhai Patel** for the Crop-Pest Map in Sapota

Receiving **"Federation of Gujarat Industry Award (2012)"** from the then **Visionary Hon. Chief Minister of Gujarat Shri. Narendra Modi** for the conversion of Technology in to Industry

Integrated Pest Management
for Higher Fruit Production

Background & Objectives

Three districts of South Gujarat: Surat, Navsari and Valsad are leaders in horticulture. These are also part of an agri-export zone for fruits and vegetables. But, the life of these fruit-farmers was made miserable by tiny fruit fly. Fruit fly is a major pest of mango, sapota and cucurbits. Intensity of damage recorded was as high as over 30 percent in mango and sapota, and between 20-40 percent in cucurbitaceous vegetables. Fruit flies cause heavy damage in terms of quality and quantity to the farmers every year. Insecticidal sprays, though they control infestation a little bit, are not only uneconomical but they leave residual effect much above tolerance limit, affecting adversely the prospects of export of such fruits and vegetables.

Fruit flies are a modern-day pestilence which ravage production. These flies, moreover, are good fliers and therefore their spread is extensive. Hence, area wide adoption of management strategy is required. Male Annihilation Technique (MAT), an Integrated Pest Management Technique (IPM), which uses sexual lures to capture males of fruit flies and kill them, is the only way to control growth and spread of fruit flies. This however, requires a Community approach for implementation.

Navsari Agriculture University designed, developed and commercialized an eco-friendly, economical and easily adoptable fruit fly trap popularly known as "Nauroji-Stonehouse Fruit Fly Trap". The trap uses Methyl Eugenol and Cuelures as par pheromones well-known for fruit flies. In this trap, plywood blocks are soaked in the solution of lures + solvent + insecticide. Such traps remain effective for 5 to 6 months, which cover the entire fruiting period in mangos, sapota as well as cucurbitaceous vegetables and no recharge is necessary. It is eco-friendly, economical and easily adoptable.

It was decided to adopt this technology and spread it in the Surat-Navsari-Valsad belt for controlling and managing the fruit fly problem. It was also recognised that wide area adoption would help in developing this zone as a Pest Free Area (PFA). The project was taken up under RKVY.

Intervention

Nauroji-Stonehouse Fruits Fly Traps are prepared in food quality Testing Laboratory, NAU Navsari. Six talukas viz., Gandevi, Chikhali, Valsad, Pardi, Dharampiur and Kaprada of Navsari and Valsad districts were selected for the purpose. A block of orchards in each village in each Taluka was selected for first year implementation. Other blocks were selected during the following years.

In the selected blocks, farmers of all categories were covered. Traps were distributed to the farmers taking into account their area of plantation of mango, sapota and cucurbitaceous vegetables. Farmers' meetings were organised at village level to educate them regarding biology of fruit fly, nature of damage, technology for its management, installation of traps etc. They were educated by delivering lectures using LCD projector, display of flex banner, booklet and actual demonstration of the traps. To generate awareness of technology, 93 farmer's group training meets were scheduled. During group meetings scientific information of fruit flies emphasizing the life cycle of the pest, host range, damage symptoms, severity of damage and control methods to combat the pest in eco-friendly manner were covered. Gram Panchayats, Village level co-operative societies and milk collecting centres collaborated in organising meetings, preparing lists of farmers, disbursement of traps etc.

With all this training and awareness, Farmers themselves installed the traps in their fields. Fruit fly population was also recorded at fortnightly intervals during the fruiting period in randomly selected orchards. The percent damage of fruits was worked out from orchards where traps were installed as well as uninstalled orchards. The level of damage in treated and untreated orchards was compared to know the actual impact of technology.

In all, 209 villages in 6 talukas of two districts were selected as target area during 2009 and 2010. The project was implemented in about 6814 ha area comprising of 6367 ha of fruit orchards and 447 ha of melon orchards of 15339 farmers of all categories. 1,10,640 traps were distributed to the farmers in the targeted villages for mango, sapota and cucurbitaceous vegetables.

Farmers were also educated on maintaining sanitation in the orchard. The fallen/damaged fruits in the orchards were collected

Preparation of Fruit Fly Trap


Supervision


Plywood blocks in trays


Preparation of chemical mixture


Blocks soaking in chemical (24 Hrs)


Heap of soaked blocks


Nailing & Threading


Sealing of blocks


Blocks ready to install in traps


Labels of trap


Ready fruit fly trap


Trapped fruit flies

by the farmers and buried in the pits with application of methyl parathion dust to minimize further multiplication of fruit flies. About 6000 booklets were disbursed to the farmers while 500 flex banners were displayed in the target villages. Data on fruit fly catches and infestation were recorded regularly in the target area.

The project involved an investment of ₹ 7.86 crores funded through RKVY.


Fruit Flies trapped in Fruit Fly Trap

Outcome

By installing the fruit fly traps in a wide area it was possible to successfully bring down the infestation level to 3 to 4 percent, which meant 85 percent control of the pest. Using this technology, the fruit fly damage in mango orchards minimised to 3.06 (0 to 4) percent and the damage in untreated orchards was 30.34 (30 to 35%) percent. Thus, more than 85.0 percent damage due to fruit fly was reduced which resulted in increase of 27.27 percent yield.

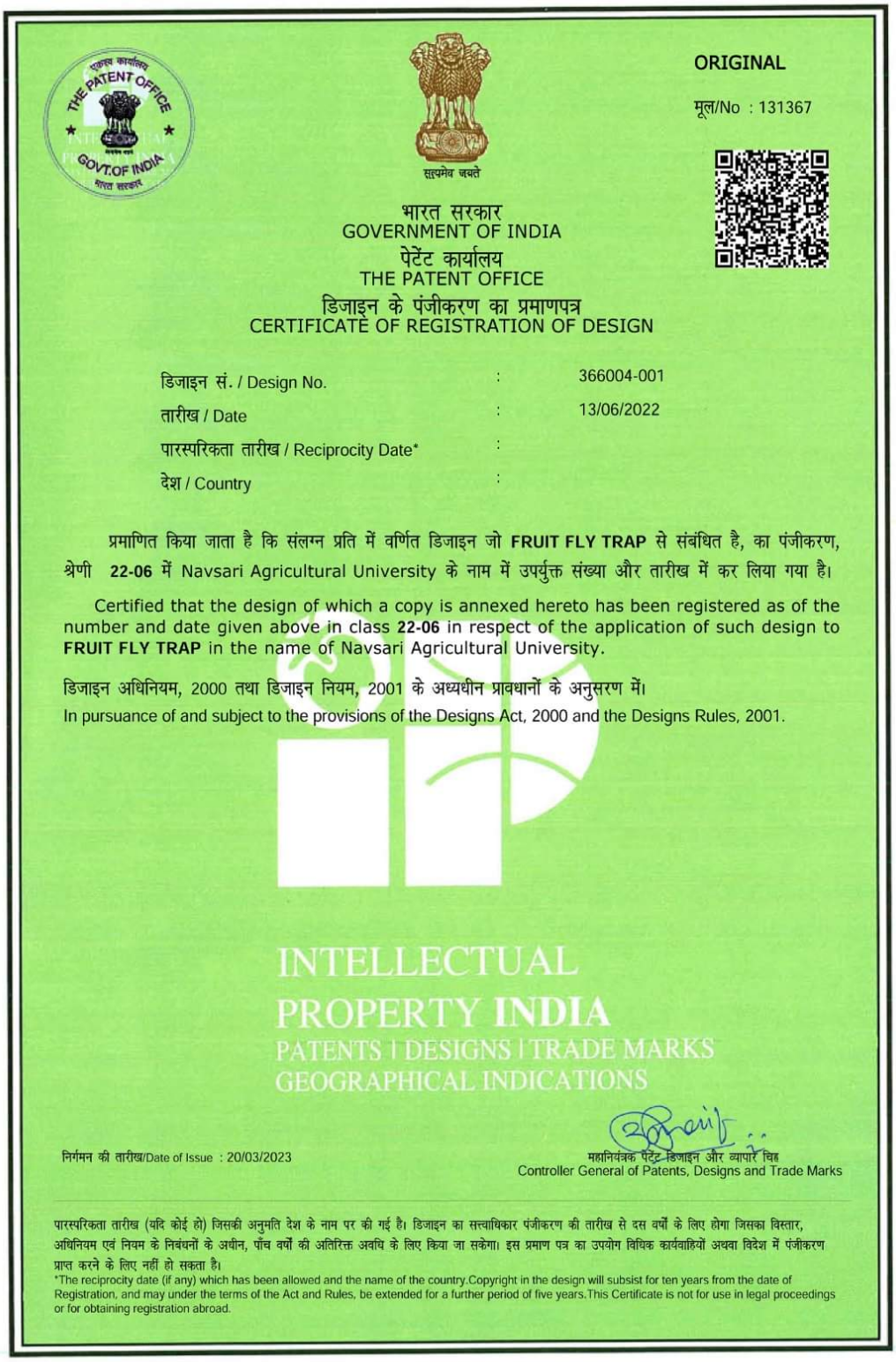
Moreover, being an eco friendly approach, it was possible to certify the produce as organic. Thus, the quality of a large quantity of fruits and vegetables improved making them suitable for export. Low expenditure incurred on the control of fruit fly could motivate the growers and possibly enhance the sustainability of the technology demonstrated. The area wide adoption of fruit fly traps could effectively kill the male flies and thereby check further multiplication without disturbing the ecosystem. If such technology is adopted for a considerable time it would definitely be helpful in recognizing the area as PFA (Pest Free Area) and ultimately it will help boosting the export trade.

About 15339 farmers of all categories as well as free riders of six talukas in two districts could save about ₹ 35 crores every year by controlling fruit flies in mango, sapota and cucurbitaceous vegetables. The quality of the products, increase in production and goodwill generated in terms of healthy production ultimately benefited the farmers adopting this technology. Area wide control strategy is not known in our country. Therefore, farmers could also ascertain the actual benefits of adopting such technology which will further motivate them in future.

The effectiveness of low cost IPM technology in controlling infestation of fruit fly disseminated through the RKVY project has brought tremendous behavioral changes in the attitude of fruits and vegetable farmers. Now farmers have adopted this technology which has resulted in export oriented organic production of fruits and vegetables.

In terms of cost-benefit analysis, an estimated benefit of ₹ 81,840/ha is achieved by spending merely ₹ 350/ha. Thus, implementation of fruit fly technology in over 6000 ha of mango could have benefited the farmers to the tune of about ₹ 49 crore, while in case of cucurbitaceous vegetables, the fruit fly damage was minimised up to 2.5 to 4.6 percent by using the technology while the damage was 19 to 32 (30.50) percent in untreated fields. Thus, more than 85.0 percent damage due to fruit fly was reduced resulting in yield increase of 27 percent. Ultimately an estimated benefit of ₹ 26,250/ha in bitter gourd and ₹ 39,350/ha in bottle gourd was attained by spending only ₹ 550/ha. Thus, implementation of fruit fly technology in over 447 ha of cucurbitaceous vegetables crops benefited the farmers to the tune of ₹ 1 crore.

The "NAUROJI STONEHOUSE FRUIT FLY TRAP" ergonomically designed, prepared and commissioned by Dr. Z. P. Patel during his service at Fruit Research Station, Gandevi was registered by the Controller General of Patents, Designs & Trade Marks, Patent Office, Government of India in pursuance of and subject to the provisions of the Design Act, 2000 and the Designs Rules, 2001.



ORIGINAL

मूल/No : 131367

सत्यमेव जयते

भारत सरकार
GOVERNMENT OF INDIA
पेटेंट कार्यालय
THE PATENT OFFICE

डिजाइन के पंजीकरण का प्रमाणपत्र
CERTIFICATE OF REGISTRATION OF DESIGN

डिजाइन सं. / Design No.	:	366004-001
तारीख / Date	:	13/06/2022
पारस्परिकता तारीख / Reciprocity Date*	:	
देश / Country	:	

प्रमाणित किया जाता है कि संलग्न प्रति में वर्णित डिजाइन जो **FRUIT FLY TRAP** से संबंधित है, का पंजीकरण, श्रेणी **22-06** में Navsari Agricultural University के नाम में उपर्युक्त संख्या और तारीख में कर लिया गया है।

Certified that the design of which a copy is annexed hereto has been registered as of the number and date given above in class **22-06** in respect of the application of such design to **FRUIT FLY TRAP** in the name of Navsari Agricultural University.

डिजाइन अधिनियम, 2000 तथा डिजाइन नियम, 2001 के अध्यधीन प्रावधानों के अनुसरण में।
In pursuance of and subject to the provisions of the Designs Act, 2000 and the Designs Rules, 2001.

INTELLECTUAL PROPERTY **INDIA**
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निर्गमन की तारीख/Date of Issue : 20/03/2023

महानियंत्रक पेटेंट डिजाइन और व्यापार चिह्न
Controller General of Patents, Designs and Trade Marks

पारस्परिकता तारीख (यदि कोई हो) जिसकी अनुमति देश के नाम पर की गई है। डिजाइन का सत्वाधिकार पंजीकरण की तारीख से दस वर्षों के लिए होगा जिसका विस्तार, अधिनियम एवं नियम के निबंधनों के अधीन, पाँच वर्षों की अतिरिक्त अवधि के लिए किया जा सकेगा। इस प्रमाण पत्र का उपयोग विधिक कार्यवाहियों अथवा विदेश में पंजीकरण प्राप्त करने के लिए नहीं हो सकता है।

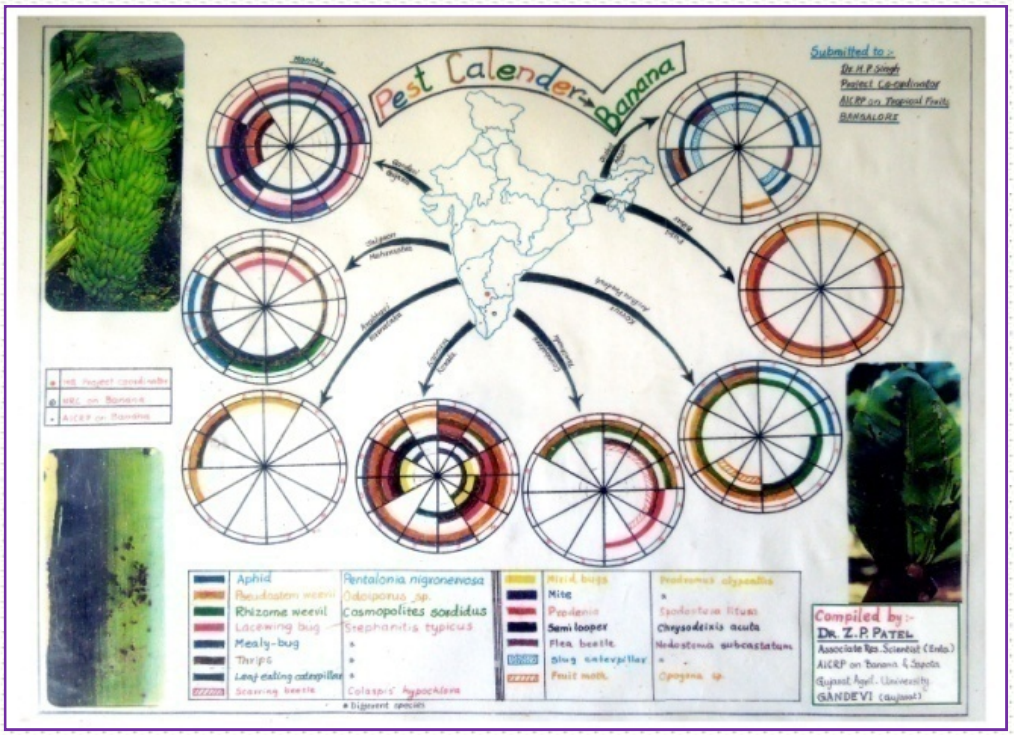
*The reciprocity date (if any) which has been allowed and the name of the country.Copyright in the design will subsist for ten years from the date of Registration, and may under the terms of the Act and Rules, be extended for a further period of five years.This Certificate is not for use in legal proceedings or for obtaining registration abroad.

Achievement of Faculties:

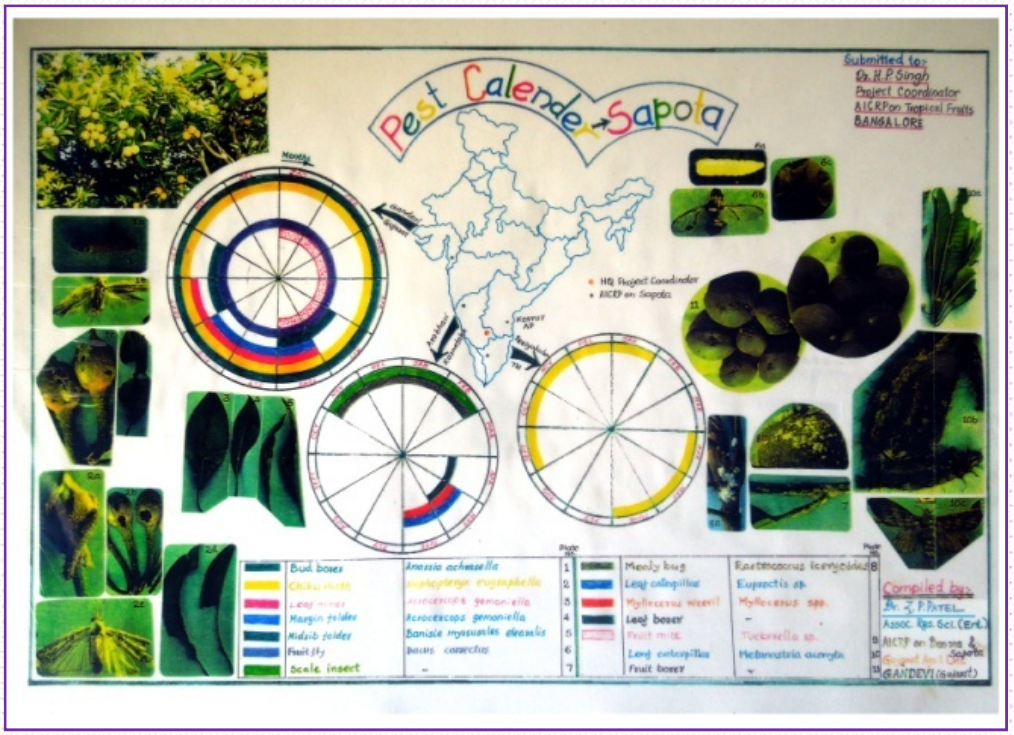
- **Dr. Z. P. Patel** [Associate Research Scientist (Ento.)] conferred **"Sardar Patel Agricultural Research Award" (cash prize of Rs. 50,000/-),** first in the discipline of Plant Protection by Govt. of Gujarat for his work on 'Contribution in Sapota Entomology Advancement of Its Knowledge and Farmers' Adoption' by Shri. Keshubhai Patel, Hon. Chief Minister of Gujarat at Gandhinagar on 6th June, 2000.
- **Dr. Z. P. Patel**, [Professor (Ento.)] conferred **"Federation of Gujarat Industries Award"** by Govt. of Gujarat for his work by Shri. Narendrabhai Modi, Hon. Chief Minister of Gujarat at Gandhinagar during 2012.
- **K. D. Bisane** (Jr. Entomologist) honored with **"Fellow of Entomological Society of India"** by Entomological Society of India, Indian Agricultural Research Institute (IARI), New Delhi during 2013.
- **K. D. Bisane** (Jr. Entomologist) honored with **"Fellow of the Society for Bio-control Advancement"** by Society for Bio-control Advancement, ICAR-National Bureau of Agricultural Insect Resources (NBAIR), Bengaluru during 2014.
- **A. N. Patel; A. R. Patel and T. R. Ahir** conferred **1st Rank in Poster presentation** in National seminar on "Role of Organic Farming in Climate Resilient and Sustainable Agriculture" held at ASPEE College of Horticulture and Forestry, NAU, Navsari during 9th -10th January, 2014.
- **K. D. Bisane, B. M. Naik and A. N. Patel** conferred **2nd Rank in Poster presentation** in National seminar on "Role of Organic Farming in Climate Resilient and Sustainable Agriculture" held at ASPEE College of Horticulture and Forestry, NAU, Navsari during 9th -10th January, 2014.
- **K. D. Bisane** (Jr. Entomologist) recognized as **"Zonal Councillor (West Zone)"** in "**Pest Management in Horticultural Ecosystem"** Journal published by 'Association for Advancement of Pest Management in Horticultural Ecosystem (AAPMHE)', ICAR-Indian Institute of Horticultural Research (IIHR), Bengaluru since 2015.
- **K. D. Bisane** (Jr. Entomologist) conferred **"Young Scientist Award"** from Bioved Research Institute of Agriculture, Technology & Science (BRIATS), Allahabad in 2016.
- **K. D. Bisane** (Jr. Entomologist) conferred with **2nd Rank in Oral presentation** in National Symposium on "Sustainable Management of Pests and Diseases in Augmenting Food and Nutritional Security" held at NAU, Navsari during 22nd to 24th January, 2019.
- **K. D. Bisane** (Jr. Entomologist) awarded with **Best Oral presentation** in International Conference on "Plant Protection in Horticulture (ICPPH-2019) - Advances and Challenges" held at ICAR-IIHR, Bengaluru- 560089 (Karnataka) during 24th to 27th July, 2019.
- **Dr. K. D. Bisane** (Jr. Entomologist) conferred **"Young Scientist Award 2020"** in the 2nd National Conference on "Recent Scientific Advances in Agricultural and Environmental Sciences" organized by Dr. B. Vasantharaj David Foundation, Chennai on 5th December, 2020.
- **Dr. Pravin Kumar Modi** (Jr. Horticulturist) conferred **"Young Researcher Award 2020"** by Institute of Scholar (InSc).
- **Dr. Ankur P. Patel** (Horticulturist) conferred **"Best Horticulturist Award"** on the occasion of 1st International Conference GIRISDA- 2022 jointly organized by Guru Kashi University, Talwadi Sabo, Punjab and Just Agriculture – The Magazine.
- **Dr. Pravin Kumar Modi** (Jr. Horticulturist) conferred **"Dr. H. B. Singh Award"** on the occasion of 1st International Conference GIRISDA- 2022 jointly organized by Guru Kashi University, Talwadi Sabo, Punjab and Just Agriculture – The Magazine.
- K. R. Solanki and **Dr. K. D. Bisane** conferred **3rd Rank in Poster presentation** in '2nd Indian Horticulture Summit-2022' organized by Society for Horticultural Research and Development (SHRD) at NAU, Navsari (Gujarat) during 27th to 29th April, 2022.
- **Dr. P. K. Modi, Dr. K. D. Bisane, Dr. A. P. Patel** and **Dr. Prakash Patil** awarded with **Best Oral presentation** in Global Conference on "Precision Horticulture for Improved Livelihood, Nutrition and Environmental Services" held at JISL, Jalgaon (M.S.) during 28th to 31st May, 2023.
- **Dr. K. D. Bisane** awarded with 3rd Rank in Oral presentation in International Conference on "Next-Gen Preparedness for Food Security and Environmental Sustainability" held at AAU, Jorhat (Assam) during 22nd to 24th November, 2023.

Pest Calendar:

- **Dr. Z. P. Patel** [Associate Research Scientist (Ento.)] had first time prepared pest calendar in banana and sapota based on status of insect pests of different regions of India. The copy of pest calendars was submitted to Dr. H. P. Singh, Project Coordinator, AICRP on Tropical fruits, Bangalore (Karnataka).

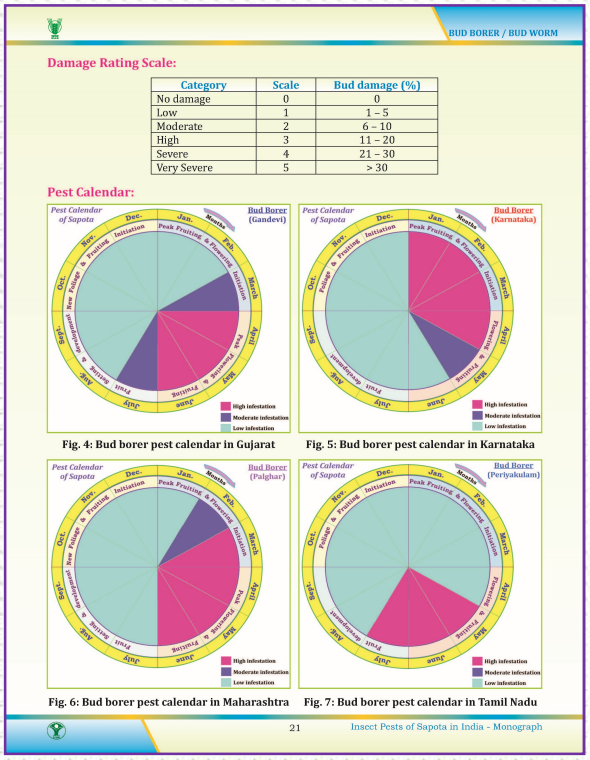


Banana Pest Calendar



Sapota Pest Calendar

➢ **Dr. K. D. Bisane** (Jr. Entomologist) had modified pest calendar as pest-wise in sapota based on infestation level of major insect pests of various states of India. The design was included in *Insect Pests of Sapota in India – Monograph* published by ICAR-AICRP (Fruits), ICAR-IIHR, Bengaluru during 2018.



BUD BORER / BUD WORM

Damage Rating Scale:

Category	Scale	Bud damage (%)
No damage	0	0
Low	1	1 – 5
Moderate	2	6 – 10
High	3	11 – 20
Severe	4	21 – 30
Very Severe	5	> 30

Pest Calendar:

Fig. 4: Bud borer pest calendar in Gujarat

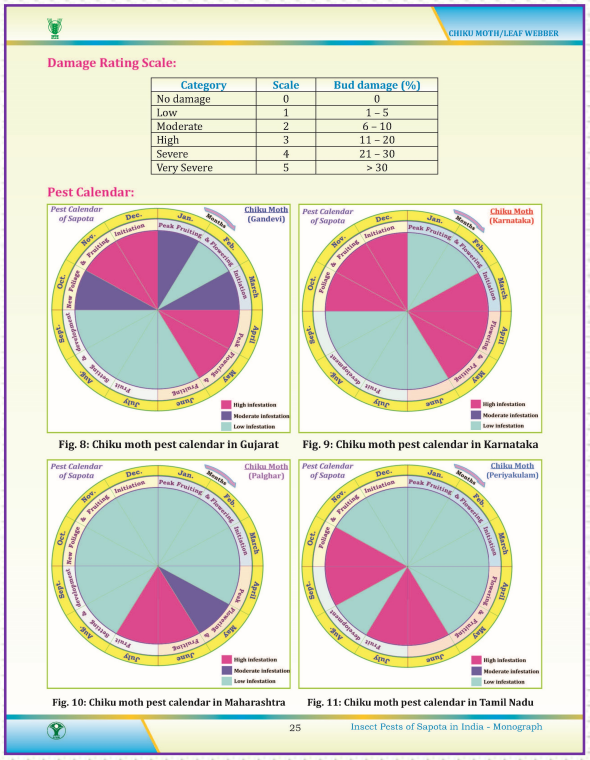
Fig. 5: Bud borer pest calendar in Karnataka

Fig. 6: Bud borer pest calendar in Maharashtra

Fig. 7: Bud borer pest calendar in Tamil Nadu

21 Insect Pests of Sapota in India - Monograph

Bud borer Pest Calendar



CHIKU MOTH/LEAF WEBBER

Damage Rating Scale:

Category	Scale	Bud damage (%)
No damage	0	0
Low	1	1 – 5
Moderate	2	6 – 10
High	3	11 – 20
Severe	4	21 – 30
Very Severe	5	> 30

Pest Calendar:

Fig. 8: Chiku moth pest calendar in Gujarat

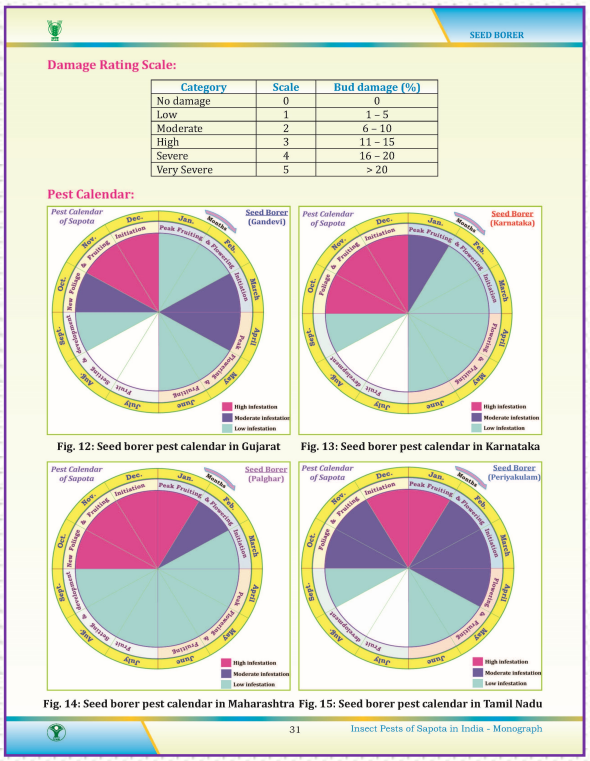
Fig. 9: Chiku moth pest calendar in Karnataka

Fig. 10: Chiku moth pest calendar in Maharashtra

Fig. 11: Chiku moth pest calendar in Tamil Nadu

25 Insect Pests of Sapota in India - Monograph

Chiku moth Pest Calendar



SEED BORER

Damage Rating Scale:

Category	Scale	Bud damage (%)
No damage	0	0
Low	1	1 – 5
Moderate	2	6 – 10
High	3	11 – 15
Severe	4	16 – 20
Very Severe	5	> 20

Pest Calendar:

Fig. 12: Seed borer pest calendar in Gujarat

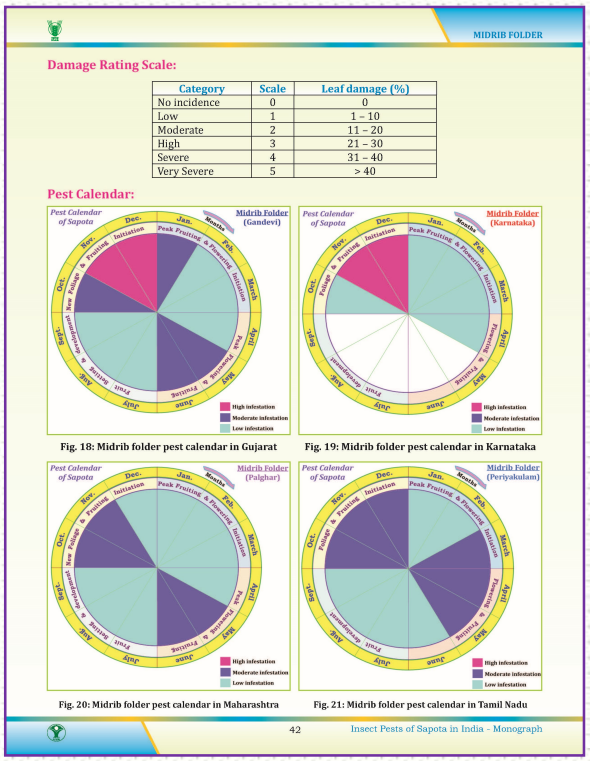
Fig. 13: Seed borer pest calendar in Karnataka

Fig. 14: Seed borer pest calendar in Maharashtra

Fig. 15: Seed borer pest calendar in Tamil Nadu

31 Insect Pests of Sapota in India - Monograph

Seed borer Pest Calendar



MIDRIB FOLDER

Damage Rating Scale:

Category	Scale	Leaf damage (%)
No incidence	0	0
Low	1	1 – 10
Moderate	2	11 – 20
High	3	21 – 30
Severe	4	31 – 40
Very Severe	5	> 40

Pest Calendar:

Fig. 18: Midrib folder pest calendar in Gujarat

Fig. 19: Midrib folder pest calendar in Karnataka

Fig. 20: Midrib folder pest calendar in Maharashtra

Fig. 21: Midrib folder pest calendar in Tamil Nadu

42 Insect Pests of Sapota in India - Monograph

Midrib folder Pest Calendar

NOTEWORTHY ACHIEVEMENT OF GANDEVI

Coconut cv. Gandevi Selection

It is hybrid of cross between Tall x Dwarf cultivar recommended for South Gujarat region. It is famous for kernel and nut water taste with moderate height tree **(1967)**

Nut

Kernal (Copra)

Dehusked nut

Matured Tree of cv. Gandevi Selection

Sr. No.	Characteristics	Value / Feature
1.	Tree height (m)	15-20
2.	Tree girth (cm)	120-130
3.	Fruit length (cm)	19-20
4.	Fruit girth (cm)	15-16
5.	Fruit weight (kg)	2.0-2.1
6.	Nut water content (ml)	550-600
7.	Fruiting initiation (years)	6-7
8.	Kernal (Copra) weight (g/fruit)	180-200
9.	Fruit yield (nut/tree/year)	100-120
10.	Fruit shape	Oblong with triangle
11.	Quality of coconut water and kernel	Firm texture and sweet flavour

Use of *Rayan/Khiranee* as rootstock

Innovation of *Rayan/Khiranee* as rootstock (approx. $2^{1/2}$ years) for propagation of sapota seedlings in India first time from this centre

(GAU- 1977- Proposer: Dr. R. S. Amin).

Seedlings of *Rayan/Khiranee* as rootstock

Inarch grafting with *Rayan/Khiranee* as rootstock

1	2	3	4	5	6	7	8
VI.	**Plant Pathology**						
	For the control of mango diseases, a schedule comprising four sprayings viz., Copper Oxychloride 0.2% + Zineb 0.2%, after the completion of heavy showers of rain, Wettable sulphur 0.2% before initiation of flowering. Carbendazim 0.03% immediately after pea sized fruit formation and Zineb 0.2% before maturation of stone, is recommended.	XIV	1984	College of Agriculture, Junagadh and Farmer's fields at Vanthali	-do-	Net ICBR 1 : 2.10. Improved the yield by 91%, i.e., 15 kg/ha.	The pathogen of anthracnose attacks leaves, twigs, inflorescence and fruits. One of the reasons for dropping of flowers and small fruits is this disease. Leaves are dried and shrivelled due to the blight of mango.
II.	**CHIKU**						
I.	**Grafting**						
	Root-stock-cum-fertilizer trial studies revealed that chiku grafted on Rayan is better as compared to chiku grafted on chiku and chiku gootie. Application of cumulative dose of NPK, each @ 68g every year per tree, gave the highest yield under South Gujarat conditions.	VI	1977	Fruit Research Station, Gandevi	Zone-I, South Gujarat	Increased yield	The recommendation is adopted by the cultivators of the State.

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Documents of *Rayan*/*Khiranee* as rootstock

Banana cv. Gandevi Selection

It found superior in respect of productivity than Grand Naine as well as both these varieties were found similar on the basis of per day production

(ICAR-AICRP on Fruits- 2003 - Proposer: Dr. C. B. Patel and associates)

Banana Bunch cv. Gandevi Selection

Sr. No.	Characteristics	Average value
1.	Plant height (m)	19.05
2.	Stem girth (cm)	80.80
3.	No. of leaves	26.50
4.	Flowering (shooting) days	380.0
5.	Maturity days	510.0
6.	Bunch length (cm)	78.0
7.	Bunch girth (cm)	110.0
8.	No. of hands/bunch	12.50
9.	No. of figures/bunch	302.5
10.	Finger length (cm)	21.50
11.	Finger girth (cm)	12.20
12.	Bunch weight (kg/plant)	35.0
13.	Yield (t/ha)	96.27
14.	Productivity ((t/day)	0.21
15.	TSS	19.0
16.	Pulp skin ratio	3.0
17.	Weigh loss due to ripening (%)	16.0
18.	Ripening days	10.0

National Consultation Meeting on Sapota

The programme was jointly organized by ICAR-AICRP on Fruits, IIHR, Bengaluru and Navsari Agricultural University, Navsari on 29th September, 2015 at ASPEE, College of Horticulture and Forestry, NAU, Navsari aimed in developing a road map involving the various stakeholders including researchers and developmental agencies of sapota.. On the occasion, Dr. T. Janakiram, ADG (Hort. Sci. I), ICAR, New Delhi inaugurated the function and Dr. C. J. Dangaria, Vice-Chancellor, NAU was president of the meeting along with Dr. A. N. Sabalpara, Director of Research, NAU, Navsari; Dr. Prakash Patil, Project Coordinator (Fruits), IIHR, Bengaluru and Dr. B. N. Patel, Dean, ACHF, NAU, Navsari. More than 100 delegates from the SAU-based and ICAR-institute based centres of AICRP, research scholars, progressive farmers, policy makers, SHGs and presidents of the growers associations, co-operative societies, self-help groups related to processing and traders were brought together on a common platform during the meet for developing the future road map.

On occasion, Dr. C. J. Dangaria emphasized the problems associated with marketing and processing of sapota, which were the major issues related to sapota cultivation in Gujarat. Dr. Janakiram emphasized the important researchable issues in relation to sapota, such as post-harvest management and use of micronutrients and crop regulation, which are areas yet to be addressed. Dr. Prakash Patil, Project Coordinator (Fruits), gave a brief presentation about the scenario of sapota cultivation in the country and also spoke about the genesis of the consultation meeting. Fruitful interactions were conducted among the stakeholders, scientists and policy makers. An exhibition of the different sapota.




MEMORANDUM OF UNDERSTANDING SIGNED

1. National Agri-Food Biotechnology Institute (NABI), Mohali (Punjab) has made an Agreement on 03-08-2021 with Fruit Research Station, Navsari Agricultural University, Gandevi for "Banana Biofortification and Disease Resistance Project" with five collaborating Institutes namely NABI, National Research Centre on Banana (NRCB), Tiruchirapalli (T.N.); Bhabha Atomic Research Centre (BARC), Mumbai; Indian Institute of Horticultural Research (IIHR), Bengaluru and Tamil Nadu Agriculture University (TNAU), Coimbatore, with support from Biotechnology Industry Research Assistance Council (BIRAC), a Public Sector Enterprise of Department of Biotechnology, Government of India. Under this project, NAU will conduct Event Selection Trials of GE banana events at Gandevi centre and the duration of this Agreement is for a period of three years (2021 to 2024).

પ્રોત્સાહન | ભારત સરકાર પ્રોજેક્ટ માટે કુલ 49 લાખ ગણદેવી ફળ સંશોધન કેન્દ્રને આપશે

નવસારી કૃષિ યુનિવર્સિટીને સરકાર તરફથી ઇન્ટર નેશનલ બાયો ફોર્ટીફાઇડ બનાના પ્રોજેક્ટ અપાયો

નવસારી ભાસ્કર તા.૧૬-૯-૨૦૨૧

Navsari Bhaskar, dated- 16-09-2021

2. MoU of "Banana Macro-propagation Technology" for Transfer of Technology (ToT) has inked on dated 8th October, 2021 with ICAR-NRCB, Tiruchirapalli (T.N.) as Technology Inventor and ICAR-AICRP (Fruits), ICAR-IIHR, Bengaluru as Technology Facilitator and FRS, NAU, Gandevi as Technology Provider (1 no.).

MoU of "Banana Macro-propagation Technology" for Transfer of Technology (ToT) has inked in presence of Dr. S. Uma, Director, ICAR-NRCB, Tiruchirapalli (T.N.)

3. ICAR-AICRP (Fruits), FRS, NAU, Gandevi has singed MoU with eleven (11) farmers and one (1) nursery on dated 18th November, 2021 for production of banana planting material at his farms and commercialization purpose through "Banana Macro-propagation Technology". The details list of above as given below.

S.N.	Name of the Farmer	Address
1.	Shri. Bhoye Tusharbhai Yeshubhai	At. Post. Tekpada, Taluka: Waghai District: Dang
2.	Shri. Chaudhari Pradipbhai Bhupatsinh	At. Post: Pipalwada, Taluka: Dolvan, Dist: Tapi
3.	Shri. Solanki Anilkumar Kalidasbhai	At. Post: Taraj, Taluka: Palsana, Dist: Surat
4.	Shri. Siyodia Nanubhai Chhabildas	At. Post: Siyod, Taluka: Palsana, Dist: Surat
5.	Shri. Siyodia Ajitbhai Kanjibhai	Taluka: Palsana, Dist: Surat Pin: 394352
6.	Shri. Patel Parth Kishorchandra	At. Post: Lakhanpor, Taluka: Palsana, Dist: Surat
7.	Shri. Chaudhary Ramanbhai Lachhiyabhai	At.: Khutli, Post: Aamdha, Taluka: Kaprada, Dist: Valsad
8.	Shri. Jadhav Babubhai Ramubhai	At.: Khutli, Post: Aamdha, Taluka: Kaprada, Dist: Valsad
9.	Shri. Ojariya Mangalbhai Rupabhai	At.: Khutli, Post: Aamdha, Taluka: Kaprada, Dist: Valsad
10.	Shri. Sureshbhai Chhanabhai Bhorasat	At.: Khutli, Post: Aamdha, Taluka: Kaprada, Dist: Valsad
11.	Shri. Ghulum Chandrakantbhai Mahujiya	At. Ghana, Post: Lavchali, Taluka: Suber, Dist: Dang
12.	Jarvi Nursery, Shri. Jayeshbhai Nathubhai Patel	At. Post: Bharadiya, Taluka: Valiya, Dist: Bharuch

MOu singed with farmers

Field Day at banana Macro-propagated plants orchard

Production of banana Macro-propagated plantlets at farmers field

4. Two MoU of “Macro-propagation Technology of Banana” was executed on 29-12-2022 between ICAR-AICRP (Fruits), FRS, NAU, Gandevi and 1. Richa Horticultural Service (Shri. Chandrakant Patel), Vadodara and 2. Muni Seva Ashram (Shri. Vikram Patel), Vadodara for production of banana planting material for commercial use in presence of Dr. Z. P. Patel, Hon'ble Vice-Chancellor, NAU, Navsari and Dr. T. R. Ahlawat, Director of Research.

Two MoU signed in presence of Dr. Z. P. Patel, Hon'ble Vice-Chancellor and Director of Research, NAU, Navsari

Traning given for production of banana Macro-propagated plantlets

XI Group Discussion of ICAR-All India Coordinated Research Project on Fruits

XI Group Discussion of ICAR-AICRP on was organized at NAU, Navsari on 22nd January, 2023 with presidency of Dr. Z. P. Patel, Hon'ble Vice-Chancellor, NAU, Navsari and Chief Guest as Dr. V.B. Patel, ADG (F&PC), ICAR, New Delhi. In the ceremony, Guest of Honour were Dr. B.M.C. Reddy, ICAR Special Invitee & Former VC, DRYSRHU, Venkataramannagudem and Dr. V. A. Parthasarathy, ICAR Special Invitee & Former Director, ICAR-IISR, Kozikode along with Dr. Prakash Patil, National Organizing Secretary & Project Coordinator (Fruits), ICAR-IIHR, Bengaluru; Dr. Timur R. Ahlawat, Director of Research, NAU, Navsari and Dr. Ankur P. Patel, Local Organizing Secretary & Officer In-Charge, FRS, Gandevi.

The event was organized by Fruits Research Station, NAU, Gandevi. In group meeting, Directors of various Nodal crop Institutes and ICAR, New Delhi along with over 150 delegates from 30 SAU-based centres, 14 ICAR-Institute-based centres, 4 CAU-based centres participated to reviews progress, featuring notable experts recommending production and protection technologies for mandated fruit crops. Also, eight successful beneficiaries across the county of special programme under TSP & SCSP scheme were awarded for their achievements in fruit crops.

The Plenary Ceremony of XI Group Discussion of ICAR-AICRP on Fruits was organized at NAU, Navsari on 25th January, 2024 with presidency of Dr. Sanjay Kumar Singh, DDG (Hort. Sci.), ICAR, New Delhi along with Dr. Prakash Patil, National Organizing Secretary & Project Coordinator (Fruits), ICAR-IIHR, Bengaluru; Dr. Timur R. Ahlawat, Director of Research, NAU, Navsari and Dr. Ankur P. Patel, Local Organizing Secretary & Officer In-Charge, FRS, Gandevi.


XI Group Discussion
of
ICAR-All India Coordinated Research Project (AICRP) on Fruits
22nd to 25th January, 2024


CENTRAL EXAMINATION HALL


XI Group Discussion
of
ICAR-All India Coordinated Research Project (AICRP) on Fruits
22nd to 25th January, 2024


25.01.2024 10:09


XI Group Discussion
of
ICAR-All India Coordinated Research Project (AICRP) on Fruits
22nd to 25th January, 2024
Organized By:
Fruit Research Station, Gandevi,
Navsari Agricultural University, Navsari
Indian Council of Agricultural Research, New Delhi

Activity under Tribal Sub-Plan under ICAR-AICRP (Fruits)

- **2014-15:** Six (6) demonstrations in Dang district and Five (5) in Valsad district on banana cv. Grand Naine Tissue culture plants.
- **2015-16:** Five (5) demonstrations in Dang district and Nine (9) in Valsad district on banana cv. Grand Naine Tissue culture plants.
- **2016-17:** Three (3) demonstrations in Dang district and Twelve (12) in Valsad district on banana cv. Grand Naine Tissue culture plants.
- **2017-18:** Nine (9) demonstrations in Dang district and Eight (8) in Valsad district on banana cv. Grand Naine tissue culture plants.
- **2018-19:** Six (6) demonstrations in Dang district and Twelve three (23) in Valsad district on banana cv. Grand Naine Tissue culture plants.
- **2019-20:** Thirty (30) demonstrations in Valsad district on banana cv. Grand Naine Tissue culture plants.
- **2020-21:** Seventeen (17) demonstrations in The Dang district on banana cv. Grand Naine Tissue culture plants.
- **2021-22:** Twenty (20) demonstrations in The Dang, Valsad, Surat and Tapi district on banana cv. Grand Naine Tissue culture plants and macro-propagated plants.
- **2022-23:** Thirty (30) demonstrations in The Dang and Tapi districts on banana cv. Grand Naine Tissue culture plants and macro-propagated plants.
- **2023-24:** Ten (10) demonstrations in The Dang, Navsari and Tapi districts on banana cv. Grand Naine Tissue culture plants and macro-propagated plants.
- **2024-25:** Seventeen (17) demonstrations on farmers' field (10 farmers in Valsad + 7 farmers in Tapi district and 1 farmer in The Dangs district) + 1 farmers for value added product.

Technology Demonstrated:

- ❖ Tissue culture plants cultivation (Grand Naine).
- ❖ Use of paired row planting method.
- ❖ Stage based application of fertilizers.
- ❖ Drip irrigation and Fertigation practices.
- ❖ Inter-cropping with vegetables.
- ❖ Blue polythene bag for bunch covering.
- ❖ Application of liquid bio-fertilizers, bio-agents and Novel organic liquid nutrient supplied from NAU lab.

Activity under Scheduled caste Sub-Plan under ICAR-AICRP (Fruits)

- **2019-20:** Five (5) demonstrations in Navsari and Surat districts on banana cv. Grand Naine Tissue culture plants.
- **2020-21:** Fourteen (14) demonstrations in Navsari and Surat districts on banana cv. Grand Naine Tissue culture plants (7 in Navsari + 7 in Surat district)

Technology Demonstrated:

- ❖ Tissue culture plants cultivation (Grand Naine).
- ❖ Stage based application of fertilizers.
- ❖ Drip irrigation and Fertigation practices.

- ❖ Inter-cropping with vegetables.
- ❖ Blue polythene bag for bunch covering.
- ❖ Application of bio-agents and Novel organic liquid nutrient supplied from NAU lab.

Activity under Mission for Integrated Development of Horticulture – MIDH

- About 2100 sprouted cutting of Black Pepper cv. Pannur-1 has been prepared for sell every year (2024-25).

Activity under Banana Macropropagation Technique for production of Low cost planting material

- About 1110 Macro plants of banana prepared and sell to the farmers (2024-25).

Nursery Achievement

B. H. 5014				
Sr. No.	**Item**	**2024-25 Target**	**Achievement**	**2025-26 Target**
1.	Sapota (Approach+Saddle)	2000	944	1000
2.	Mango grafts (Approach+Saddle)	2000	1147	1200
3.	Mango grafts (Soft wood)	--	-	--
4.	Rayan seedlings	2000	1000	1000
6.	Mango seedlings	2000	1250	1200
7.	Areca nut Seedlings	500	40	100
8.	Lemon (Air layered)	1000	652	700
9.	Misc. Seedlings	2500	1686	2200
B. H. 9510-N-12				
1.	Sapota grafts (Approach+Saddle)	2000	1215	1500
2.	Mango grafts (Approach)	3500	3956	2500
3.	Mango Saddle grafts	1000	455	500
4.	Mango grafts (softwood)	500	533	--
4.	Sapota grafts (softwood)	100	53	--
5.	Banana (Macro-propagated)	3000	4682	--
	Papaya (Grafted)	500	2139	--
5.	Coconut seedlings a) West Coast Tall b) (TxD) F2 c) (DxT) F2 d) Mahuwa Selection	 3000 2000 700 150	 2660 1960 230 35	 3000 2000 300 100
6.	Rayan seedlings	2000	1000	1700
7.	Mango Seedlings	5000	5400	3500
8.	Citrus Seedlings	500	95	500
9.	Black pepper (sprouted cutting)	2500	2047	2500
10.	Papaya grafted plants	---	71	100

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