ACHIEVEMENTS

Food Quality Testing Laboratory
N. M. College of Agriculture
Navsari Agricultural University, Navsari (Gujarat)

A. Awards

Students

Sr. No.	Name of Student	Name of Award	Year	Int./National/ State/ Zonal
1	Rahul	Third Rank for the Thesis Presentation	2023	Zonal
2	Bakutra Riya Vinodkumar	Gold Medal for research in Pesticide Residue Chemistry	2023	University
3	Lokesh K Saini	best poster presentation –	2019	National
4	Lokesh K Saini	best oral presentation Award	2019	National
5	Priyanshi Rathod	best oral presentation award	2019	National

Faculties

Sr. No.	Name of Faculty	Name of Award	Year	Int./National/ State/ Zonal
1	Dr Trupti K Vyas	Best Poster Presentation Award	2014	National
2	Dr Susheel Singh	1st prize for Paper Presentation	2015	National
3	Dr Susheel Singh	Young Scientist Award	2018	National
4	Dr Susheel Singh	Best Poster Presentation Award	2018	National
5	Dr Susheel Singh	Young Scientist Award	2019	National
6	Dr Susheel Singh	Best Oral Presentation Award	2019	National
7	Dr Trupti K Vyas	Best Teacher Award	2021	National
8	Dr Trupti K Vyas	Research Excellence Award	2021	National
9	Dr Trupti K Vyas	Distinguished Academician Award	2022	National
10	Dr Trupti K Vyas	First Best Poster Presentation Award	2022	Zonal
11	Dr Susheel Singh	First Best Oral Presentation Award	2022	National
12	Dr Susheel Singh	Third Best Oral Presentation Award	2022	National
13	Dr Susheel Singh	Best Oral Presentation Award	2024	National

B. Seminar/training organized:

Sr. No.	Training	Seminar	Symposia/ Webinar	Distinguished Lecture Series	Workshop
2018-19	2	-	-	-	1
2019-20	2	-	-	5	-
2020-21	1	-	9	18	-

C. Post graduate/Ph.D. thesis

Sr. No.	Year	No. of M.Sc.	No. of Ph.D.	Total
1.	2014	1	3	4
2.	2015	2	1	3
3.	2016	2	1	3
4.	2017	2	2	4
5.	2018	5	-	5
6.	2019	-	1	1
7.	2020	3	2	5
8.	2021	-	2	2
9.	2022	2	-	2
10.	2023	1	-	1
11.	2024	2	-	2

D. Research recommendations / varieties released (2016-17 to 2023-24) as PI / Co-PI

Sr. No.	Title and Recommendation	Approval Year
1.	**Weed management practices in Aerobic rice (Oryzae Sativa L.)** The farmers of South Gujarat growing aerobic rice are recommended to adopt any of the following recommendation for effective weed management and obtaining higher yield. ➢ Pendimethalin 30 % EC 1000 g a.i./ha (100 ml/15 litre of water) as pre-emergence fb. triafamone 20% + ethoxysulfuron 10 % WG (premix) 44 +22.5 g a.i./ha (6.5 g/ 15 litre of water) at 20-25 days after sowing ➢ Pendimethalin 30 % EC 1000 g a.i./ha (100 ml/15 litre of water) as pre-emergence fb. penoxsulam 1.02% + cyhalofop-butyl 5.1% OD (premix) 120 g a.i./ha (60 ml/15 litre of water) as post-emergence	**2023 - 24**

Sr. No.	Title and Recommendation	Approval Year
	➢ Pendimethalin 30 % EC 1000 g a.i./ha (100 ml/15 litre of water) as pre-emergence fb. Hand weeding 30 DAS ➢ Pretilachlor 30 % + pyrazosulfuron-ethyl 0.75 % WG (premix) 600 +15 g a.i./ha (60 g/15 litre of water) fb. metsulfuron-methly 10% + chlorimuron-ethly 10 % WP (premix) 4 g a.i./ha (0.60 g/15 litre of water) ➢ Pretilachlor 30 % + pyrazosulfuron-ethyl 0.75 % WG (premix) 600 +15 g a.i./ha (60 g/15 litre of water) fb. triafamone 20% + ethoxysulfuron 10% WG (premix) 44.0 +22.5 g a.i./ha (6.5 g/ 15 litre of water) at 20-25 days after sowing ➢ Pretilachlor 30 % + pyrazosulfuron-ethyl 0.75 % WG (premix) 600 +15 g a.i./ha (60 g/15 litre of water) fb. penoxsulam 1.02% + cyhalofopbutyl 5.1% OD (premix) 120 g a.i./ha (60 ml/15 litre of water) as post-emergence ➢ Pretilachlor 30 % + pyrazosulfuron-ethyl 0.75 % WG (premix) 600 +15 g a.i./ha (60 g/15 litre of water) fb. Hand weeding 30 DAS ➢ Hand weeding at 20 and 40 DAS	
2.	**Dissipation behaviour and safety assessment of afidopyropen residues in/on brinjal.** The brinjal grower of Gujarat using Afidopyropen 50 g/L DC (50 g ai/ha) are advised to observe one day waiting period by considering the maximum residue limit (0.15 mg/kg).	**2023 - 24**
3.	**Persistence and dissipation behaviour of pyrazosulfuron ethyl in soil and water in transplanted rice field.** Dissipation of pyrazosulfuron ethyl 10% WP in water and soil of rice field under South Gujarat condition follows first-order kinetics with the half-life (DT50) of 1.58-2.15 and 9.90-11.36 days, respectively and its residues were BQL in grain and rice straw when applied at the rate of 15 g ai/ha as early post-emergence in transplanted rice.	**2023 - 24**
4.	**Persistence and dissipation behaviour of pyroxasulfone in maize.** Pyroxasulfone is readily degradable in the soil under maize cultivation under South Gujarat as their dissipation half-life (DT50) is less than 20 days (i.e.9.0-9.12) as per FAO guidelines. Further, the residues of pyroxasulfone is BQL in grains and maize straw when applied at the rate of 127.5 g ai/ha as pre-emergence.	**2023 - 24**
5.	**Evaluation of different methods for manure preparation from straw and threshing waste of rice** Farmers are recommended to use *Bacillus licheniformis* X6 (104 cfu/ml) and *Aspergillus terreus* XF9 (104 cfu/ml) to reduce 13 to 18 days manure preparation time and to get good quality manure by NADEP method from paddy straw/waste in 118-123 days**.** **Detail Method for Manure Preparation:** • Prepare 15-20 cm thick paddy straw and threshing waste layer	**2022 - 23**

Sr. No.	Title and Recommendation	Approval Year
	(60 – 70 kg of paddy waste). Sprinkle 25 L of 30 % cow dung slurry containing 0.1 % of *Bacillus licheniformis* X6 (104 cfu/ml) and *Aspergillus terreus* XF9 (104 cfu/ml) over paddy waste layer. • Fill the NADEP as per its capacity by repeating above mentioned paddy waste layers. • Periodically sprinkle water to maintain moisture during manure preparation time. "ડાગરના પરાળમાથી ૧૩ થી ૧૮ દિવસનો ખાતર બનાવવાનો સમય ઘટાડવા અને સારી ગુણવત્તાવાળું ખાતર ૧૧૮ થી ૧૨૩ દિવસે મેળવવા માટે ખેડૂતોને બેસિલસ લાઈકેનિફોર્મિસ X6 (10^4 cfu/ml) અને એસ્પરજીલસ ટેરીયસ XF9 (10^4 cfu/ml) નો ઉપયોગ કરી નાડેપ પદ્ધતિથી ખાતર બનાવવાની ભલામણ કરવામાં આવે છે. **ખાતર તૈયાર કરવા માટેની વિગતવાર પદ્ધતિ:** • ડાંગરના પરાળનાં ૧૫-૨૦ સેમી જાડ સ્તર (૬૦ – ૭૦કિલો ડાંગરની પરાળ) કરવું. તેના ઉપર ૨૫ લિટર ગાયના છાણની (૩૦%) સ્લરી અને ૦.૧ % બેસિલસ લાઈકેનિફોર્મિસ X6 (10^4 cfu/ml) અને એસ્પરજીલસ ટેરીયસ XF9 (10^4 cfu/ml) ભેળવી તેનો છંટકાવ કરવો. • આ રીતે નાડેપની ક્ષમતા પ્રમાણે ડાંગરના પરાળના સ્તરો તૈયાર કરવા. • ખાતર બનાવવાના સમય દરવમયાન, ભેજ જાળવવા માટે સમયાતાંરે પાણીનો છંટકાવ કરવો"	
6.	**Persistence and dissipation studies of some registered herbicides in sugarcane** 2,4-D Dimethyl amine salt 58% SL, 2,4-D Sodium salt 80% w/w) and Halosulfuron methyl 75% WG are readily degradable in the soil under sugarcane cultivation under South Gujarat as their dissipation halflife (DT50) is less than 20 days as per FAO. Further, Halosulfuron methyl 75 % WG and 2,4 –D dimethyl amine 58% SL as well as 2,4-D sodium salt 80% W/W, when these are applied at the rate of 67.5 g a.i./ha, 3.5 kg a.i./ and 2 kg a.i./ha, respectively at 60 days after planting are found below detectable limit in sugarcane juice and leaves.	**2022 - 23**
7.	**Evaluation of rice genotypes against sheath blight caused by *Rhizoctonia solani*** Rice Genotypes viz., Mandakini Lambayeque and Aditya were found moderately resistant against sheath blight disease in artificial inoculation field conditions.	**2021 – 22**
8.	**Screening of rice promising genotypes against blast disease caused by *Pyricularia oryzae*** Rice genotypes viz., NVSR-591, NVSR 3065, IR-64 and NVSR 3110 were found highly resistant against leaf blast disease while, Lalkada (LS), HR-12 (NS), NVSR-557, NVSR-592 and GNR-4 genotypes showed highly susceptible reactions under artificial inoculation field conditions.	**2021 – 22**

Sr. No.	Title and Recommendation	Approval Year
9.	**Effect of biofilms formation in *Trichoderma-Azotobacter* interaction against *Macrophomina phaseolina*** Biofilm formed by Azotobacter chroococcum (1x107 CFU) and Trichoderma viride (1x106 CFU) leads to production of Extrapolymeric substances (EPS) which at equal proportion can help to extract EPS after 20 days incubation by ethanol precipitation. The extracted EPS @ 2g/Kg seeds of blackgram provide better colonization, increase plant growth and reduce root rot caused by Macrophomina phaseolina over microbial combination.	**2021 – 22**
10.	**Dissipation of insecticides in tomatoes grown under open field and greenhouse under South Gujarat conditions.** The tomato fruits are safer for consumption with respect to residues of chlorantraniprole, flubendiamide, indoxacarb and thiamethoxam applied at the recommended doses [Chlorantraniprole 18.5 SC (30.0g a.i/ha), Flubendiamide 20% WG (48.0 g a.i/ha), Indoxacarb 14.5 SC (60.0 g a.i/ha), Thiamethoxam 25% WG (50.0 g a.i/ha)] either grown in open field or under polyhouse condition when harvested after prescribed waiting periods [Chlorantraniprole 18.5 SC (3days), Flubendiamide 20% WG (5 days), Indoxacarb 14.5 SC (5 days), Thiamethoxam 25% WG (days)] as their terminal residues were less than Codex MRL values	**2020 - 21**
11.	**Dissipation of insecticides in tomatoes grown under open field and greenhouse under South Gujarat conditions** The tomato fruits are safer for consumption with respect to residues of chlorantraniprole, flubendiamide, indoxacarb and thiamethoxam applied at the recommended doses [Chlorantraniprole 18.5 SC (30.0g a.i/ha), Flubendiamide 20% WG (48.0 g a.i/ha), Indoxacarb 14.5 SC (60.0 g a.i/ha), Thiamethoxam 25% WG (50.0 g a.i/ha)] either grown in open field or under polyhouse condition when harvested after prescribed waiting periods [Chlorantraniprole 18.5 SC (3days), Flubendiamide 20% WG (5 days), Indoxacarb 14.5 SC (5 days), Thiamethoxam 25% WG (5 days)] as their terminal residues were less than Codex MRL values.	**2020-21**
12.	**Finger Millet, CFMV 2 (GN-9/GIRA) variety released** Approved in 17th Combined Joint AGRESCO of CISC Meeting held at Navsari during July-August, 2021	**2020-21**
13.	**Residues of paclobutrazol in mango under South Gujarat conditions** The mango growers of South Gujarat are recommended that application of paclobutrazol 25 SC as growth promoter at the rate of 7.5 g *a.i.*/tree i.e. 30 ml/10 l water in mango tree through drenching method in the month of July under condition do not pose the problem of paclobutrazol residues in mature and ripe mango fruits as its residues were well below the MRL values fixed by National and International regulatory agencies for mango.	**2019-20**

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	દક્ષિણ ગુજરાતના આંબા ઉત્પાદિને ભલામણ કરવામા આવે છે કે આંબાને પેકેલોબ્યુટ્રાજોલ ૨૫ એસ.સી.નાં ૭.૫ ગ્રા. ર્કકય તત્વ/ઝાડ એટલે કે ૩૦ મી.લી./૧૦ લી. પાણી પ્રમાણે જુલાઈ માર્મા રેડવાથી કાચી અને પાકી કેરીમા પેકેલોબ્યુટ્રાજોલના અવશેષ આવવાનું જોખમ રહેતુ નથી અને કેરીમા તેના અવશેર્ રાષ્ટ્રીય અને આંતરરાષ્ટ્રીય વનયમનિારી એજન્સીઓ દ્વારા નકક્કી કરેલ મહતમ અવશેષ મર્યાદા (MRL) કરતા ખૂબજ ઓછા જોવા મળે છે.	
14.	**Residues of paclobutrazol in Sapota under South Gujarat conditions** The scientific community is informed that sapota fruits exceeded the MRL values fixed by National and International regulatory agencies for Paclobutrazol residues which were collected during 90-120 days from the sapota tree drenched with paclobutrazol 25 SC at the rate of 7.5 g *a.i.*/ha i.e. 30 ml/10 l water in the month of September under South Gujarat conditions.	**2019-20**
15.	**Surveillance of afla toxin in pasteurized and raw milk** Navsari Agricultural University analyzed 45 milk samples from Navsari for Aflatoxin presence. It was observed that occurrence of Aflatoxin M1 was higher in winter season followed by monsoon season. Aflatoxin M1 was more in buffalo milk in comparison to cow milk samples. Pasteurized buffalo milk samples showed higher Aflatoxin M1 than raw milk whereas it was absent in pasteurized cow milk samples.	**2019-20**
16.	**Effect of ozonized water washing on pesticide residues and shelf-life of green chilli and okra** The home-makers, consumers and food processors are advised to rinse okra and chilli fruits with ozonized water for 8 minutes with commercially available ozone purifier based on Vortex Ozone Technology having ozone producing capacity of 0.5kg/hour to decontaminate the acetamiprid and ethion residues in the range of 39.18-59.43 and 51.39-59.28 %, respectively and prolongs the shelf-life of the fruits.	**2019-20**
17.	**Status of pesticide residues in seasonal green leafy vegetables in South Gujarat** The survey of pesticide residues in five leafy vegetables (coriander, colocasia, fenugreek, spinach, amaranthus) different markets of South Gujarat reveals that 48.75 % samples were positive for different pesticides. • More than 50% samples of spinach and colocasia were positive for different pesticides. • Buprofezin was the most frequently detected pesticides from different leafy vegetables. • None of vegetable sample was found exceeding the Maximum	**2019-20**

Sr. No.	Title and Recommendation	Approval Year
	permissible limit for different elements.	
18.	**Status of heavy metals in green leafy vegetables grown under South Gujarat region** It is informed to scientific community that none of vegetable sample was found exceeding the maximum permissible limit for different elements except nickel in spinach and fenugreek. Moreover, the survey of pesticides residues in randomly taken 10 samples of the three leafy vegetables that is fenugreek, spinach and amranthus from different markets of South Gujarat were detected below permissible value for different pesticides.	**2019-20**
19.	**Effect of different light sources on growth and quality of micro-greens** Scientists are informed that based on the performance of different microgreens for growth parameters like days to first harvest, leaf area (cm2), fresh weight and quality parameters *viz*., ascorbic acid, *β*-carotene, N, P, K, Ca, total antioxidant activity and overall acceptability under different light sources, electroluminescent light is recommended for growing microgreens inside growing chamber/room. • Fenugreek, beet root, red cabbage, displayed significantly maximum ascorbic acid, N, Ca; *β*-carotene, K; antioxidant activity. Based on sensory evaluation, highest score for overall acceptability was obtained by Amaranth microgreens, which was followed by beet root and red cabbage microgreens.	**2019-20**
20.	**Elephant Foot Yam, NEFY-7 (GEFY-1 (SWAGATA)** Elephant foot yam genotype NEFY-7 recorded 44.84 t/ha mean corm yield in Gujarat, where it exhibited overall 26.10 per cent corm yield superiority over national check Gajendra. Its light orange fleshed corm is reported to have appreciable amount of starch, dietary fiber, carbohydrate content, protein, vitamin A, iron, manganese, zinc and calcium in comparison to national check. The acridity feels same like "Gajendra" while consumption. The proposed genotype showed resistant reaction against collar rot disease. Elephant foot yam variety NEFY-7 is recommended for elephant foot yam growing areas of Gujarat as GEFY-1 (Swagata). Approved in 16th Combined Joint AGRESCO of CISC Meeting held at Anand june-July, 2020	**2019-20**
21.	**Delaying of the browning of sugarcane juice by various treatments** It is informed to scientific community that to retain natural taste and color of sugarcane juice up to three hours should add 0.5 g/litre of citric acid immediately after extraction of juice.	**2018-19**
22.	**Characterization of bacteriocin produced by isolated lactic acid bacteria** It is informed to scientific community that *Enterococcus faecium* produces bacteriocin which can be used *in vitro* to inhibit the growth of	**2018-19**

Sr. No.	Title and Recommendation	Approval Year
	Staphylococcus aureus, *Enterococcus faecalis*, *Serratia marcescens*, *Micrococcus luteus* and *Listeria monocytogenes*	
23.	**Dissipation and persistence of combi-product of chlorantraniliprole 9.26 % + λ cyhalothrin 4.63 % in/on pigeonpea** Pigeonpea growers of South Gujarat are recommended pre-mix formulation of chlorantraniliprole 9.26 ZC + λ-cyhalothrin 4.63 %,twice at 15 days interval starting from 50 per cent flowering stage @ 30 g a.i./ha (4.0 ml/10l water) for the control pod borer. Preharvest interval of nine days should be observed to avoid residue problem. દક્ષિણ ગુજરાતના તુવેર પકવતા ખેડૂતોને તુવેરમાંશીંગોકોરી ખાનારઇયળના નિયંત્રણ માટેલેંબડા-સાયહેલોથ્રીન ૪.૬૩ % + ક્લોરાન્ટ્રાનીલિપ્રોલ ૯.૨૬ ઝેડ સી ના ૫૦ % ફૂલ બેસવાનીઅવસ્થામાં30 ગ્રા.સ.ત./હે (૪ મિલી/૧૦ લી) ના બે છાંટકાલ કરવાની ભલામણ કરવામાં આવે છે. જંતુનાશક અવશેષ નિવારવા માટે છેલ્લા છંટકાવ અને ઉતાર વચ્ચે ઓછામાં ઓછા ૯ દિવસ સમયગાળો રાખવો.	**2017-2018**
24.	**Dissipation and persistence of spiromesifen (22.9 SC) in brinjal under south Gujarat conditions** Brinjal growers of South Gujarat Heavy Rainfall Agro-climatic Zone are recommended to apply spiromesifen 22.9 SC, twice @ 96 g a.i/ha (8.4 ml/10 lit.) at 15 days interval starting from fruit setting stage for the control of red spider mite. Pre-harvest interval of one day should be observed to avoid residue problem. દક્ષિણ ગુજરાતના ભારે વરસાદ ખેત આબોહવાકીય વિસ્તારના રીંગણની ખેતી કરતાં ખેડૂતોને લાલ કથીરિ ના નિયંત્રણ માટે સ્પાયરોમેસિફેન (૨૨.૯ એ. સી.) ના ફળ બેસવાની અવસ્થાથી૧૫દિવસ ના અંતરે ૯૬ગ્રા. સ. ત./હે (૮૪ મિલી/૧૦લિ) નાં બે છંટકાવ કરવા. જંતુનાશક અવશેષ નિવારવા માટે છેલ્લા છંટકાવ અને ઉતાર વચ્ચે ઓછામાં ઓછા ૧ દિવસ સમયગાળો રાખવો.	**2017-18**
25.	**Isolation, identification and exploitation of microbes from composting site for xylanase production for agro waste management** It is informed to scientific community that Xylanase producing *Bacillus licheniformis* X6 in combination with *Aspergillus terrus* XF9 degrade 15.5 % rice straw at ambient temperature after 40 days of incubation.	**2017-18**
26.	**Microbial pigment as food additive to replace chemically synthesized colour** Yellow and orange pigments produced by bacteria *Micrococcus luteus* and *Kocuria rosea*, respectively having antioxidant activity can be used as natural	**2017-18**
27.	**Isolation and identification of cyanobacteria as source of single cell protein** It is informed to scientific community that *Anabaena* isolate2 having	**2017-18**

<table>
<tr><th>Sr. No.</th><th>Title and Recommendation</th><th>Approval Year</th></tr>
<tr><td></td><td>high protein content (381.12 µg/mg) and antioxidant activity (28 %) has the potential to be used as single cell protein</td><td></td></tr>
<tr><td>28.</td><td>Determination of nutritional composition of minor fruits
Minor fruits (mentioned below) of South Gujarat are found rich in following parameters as compared to banana and sapota.
<table>
<tr><th>Fruits</th><th>Composition better than banana and sapota</th></tr>
<tr><td>Palmyra palm</td><td>K (3902ppm), Ca(739ppm), P (268ppm) and Zn (2.79ppm)</td></tr>
<tr><td>Jamun</td><td>Total phenol (241.6 mg/100g), Antioxidant activity (126.5 mg/100g), Ca (324ppm) and Mg (241ppm)</td></tr>
<tr><td>White wax apple</td><td>Antioxidant activity (16.4 mg/100g)</td></tr>
<tr><td>Carambola</td><td>Vitamin-C (16.1 mg/100g), Total phenol (20.8 mg/100g), Antioxidant activity (28.4 mg/100g), K (4099ppm), Ca (657ppm), Mn (3.01ppm) and Cu (2.75ppm)</td></tr>
<tr><td>Tamarind</td><td>Carbohydrates (62.8%), Protein (2.81%), Vitamin-C (18.9 mg/100g), Total phenol (25.6 mg/100g), Antioxidant activity (30.4 mg/100g), K (12433ppm), Ca (2759ppm), Mg (1286ppm), P (1099ppm), Fe (154.3ppm), Mn (6.47ppm), Zn (7.11ppm) and Cu (6.13ppm)</td></tr>
<tr><td>Jackfruit</td><td>Total phenol (31.8 mg/100g), Antioxidant activity (62.9 mg/100g), K (5135ppm), Ca (405ppm), Mg (533ppm) and Mn (5.12ppm)</td></tr>
<tr><td>Star gooseberry</td><td>Protein (4.31%), β carotene (100.7 µg/100g), Vitamin-C (17.1), Total phenol (105.0 mg/100g), Antioxidan activity (83.7 mg/100g), K (44 1ppm), Ca (4933ppm), Mg (1518ppm), P (545ppm), Fe (17.2ppm) and Zn (3.94ppm)</td></tr>
<tr><td>Lasoda</td><td>β carotene (62.7 µg/100g), Total phenol (41.8 mg/100g), Antioxidant activity (55.7 mg/100g), K (4644ppm), Ca (656ppm), P (431ppm), Mn (3.51ppm) and Zn (2.06ppm)</td></tr>
<tr><td>Kair</td><td>Protein (2.24%), Total phenol (61.5 mg/100g), Antioxidant activity (77.7 mg/100g), K (7313ppm), Ca (1011ppm), Mg (723ppm), P (999ppm) and Zn (4.71ppm)</td></tr>
<tr><td>Rayan</td><td>β carotene (87.63 µg/100g), total phenol (157.4 mg/100g), Antioxidant activity (92.6 mg/100g), Ca (284ppm) and P (321ppm)</td></tr>
</table></td><td>2017-18</td></tr>
<tr><td>29.</td><td>Waiting period of profenofos and cypermethrin in/on sapota fruits
Observation of 14 days waiting period provides residue free unripe sapota fruits when pre-mix formulation of profenofos 40% and cypermethrin 4 % EC applied twice at 15 days interval on sapota bearing trees at the rate of 0.044 % (1ml/l) to control the sapota bud borer.</td><td>2016-17</td></tr>
<tr><td>30.</td><td>Distribution pattern of profenofos and cypermethrin in peel and pulp of sapota fruits
The residues of profenos and cypermethrin were arrested in peel of unripe sapota fruits while trans-peel movement of these residues to pulp was observed in ripe sapota fruit when pre-mix formulation of</td><td>2016-17</td></tr>
</table>

Sr. No.	Title and Recommendation	Approval Year
	profenofos 40 % and cypermethrin 4% EC sprayed twice at 15 days interval at the rate of 0.044 % (1ml/l) to control the sapota bud borer on sapota bearing trees	
31.	**Waiting period of chlorpyrifos and cypermethrin in/on sapota fruits** Observation of 4 days waiting period provides residue free unripe sapota fruits when pre-mix formulation of chlorpyrifos 50 % and cypermethrin 5 % EC sprayed twice at the rate of 0.055 % (1ml/l) sprayed twice at 15 days interval on sapota fruit bearing trees to control the sapota bud borer.	**2016-17**
32.	**Distribution pattern of chlorpyrifos and cypermethrin in peel and pulp of sapota fruits** The residues of chlorpyrifos and cypermethrin arrested in peel of unripe sapota fruits when pre-mix formulation of chlorpyrifos 50 % and cypermethrin 5% EC sprayed twice at 15 days interval at the rate of 0.055 % (1ml/l) to control the sapota bud borer on sapota bearing trees.	**2016-17**
33.	**Exploring microbes for their siderophore production and their biocontrol potential** It is informed to scientific community that siderophore producing Enterobacter ludwigii TLAB1 and Pseudomonas aeruginosa TPA1 can be used in vitro to inhibit the growth of Colletotrichum sp.	**2016-17**
34.	**Exploring microbes for exopolysaccharides (EPS) production** It is informed to scientific community that exopolysaccharide produced by bacterial isolate Klebsiella vericolla showed non-Newtonian behaviour, therefore, can be used as thickening agent and also possesses antioxidant activity.	**2016-17**
35.	**Waiting period of fenazaquin in/on chilli (12.3.1.12)** To avoid fenazaquin residue in chilli, farmers are recommended to observe 12 days waiting period when fenazaquin 10 EC is applied twice 0.01 per cent (10 ml /10 l water) at 15 days interval starting from 50 per cent flowering stage. ફિનાઝાક્વીનના અવશેષ મુક્ત મરચાં મેળવવા માટે ફિનાઝાક્વીન ૧૦ ઈ.સી. ૦.૦૧ ટકા (૧૦ મી.લિ./૧૦ લિ. પાણી) ફૂલ અવસ્થા બાદ ૧૫ દિવસના અંતરે બે છાંટકાવ કરતા ખેડૂતોને છે છેલ્લા છાંટકાવ અને ઉતાર વચ્ચેનો ગાળો ઓછામાં ઓછો બાર દિવસનો રાખવાની ભિામણ કરવામાં આવે છે.	**2015-16**
36.	**Residue and dissipation pattern of fenazaquin in/on chilli under South Gujarat conditions (12.3.2.55**) Fenazaquin 10 EC applied twice @ 0.01% (10 ml /10 l water) at 15 days interval starting from 50% flowering stage in green chilli resulted in built up of residue in dried chilli powder by 5.22 to 5.79 times. Therefore, it is recommended to consider a processing factor of 5.64	**2015-16**

<table>
<tr><th>Sr. No.</th><th>Title and Recommendation</th><th>Approval Year</th></tr>
<tr><td></td><td>(i.e. 6.0) for fenazaquin for dried chilli powder.
<table>
<tr><th>DAA</th><th>Control (Water spray)</th><th>Mean Residues (µgg^{-1}) applied at the rate of 125 g a.i./ha</th><th>Residues(µgg^{-1}) in green chillies*</th><th>Processing Factor</th></tr>
<tr><td>0 (2 hrs)</td><td>-</td><td>13.19</td><td>2.53</td><td>5.22</td></tr>
<tr><td>5 day</td><td>-</td><td>8.27</td><td>1.40</td><td>5.92</td></tr>
<tr><td>10 day</td><td>-</td><td>2.94</td><td>0.53</td><td>5.61</td></tr>
<tr><td>30 day</td><td>-</td><td>0.35</td><td>0.06</td><td>5.79</td></tr>
<tr><td></td><td></td><td></td><td>Mean</td><td>5.64</td></tr>
<tr><td rowspan="2">LOD (µg/g)</td><td>Fruit</td><td colspan="3">0.01</td></tr>
<tr><td>Powder</td><td colspan="3">0.02</td></tr>
<tr><td rowspan="2">LOQ (µg/g)</td><td>Fruit</td><td colspan="3">0.04</td></tr>
<tr><td>Powder</td><td colspan="3">0.06</td></tr>
</table>
Processing factor = $\frac{\text{Residue in chilli powder}}{\text{Residue in green chilli}}$</td><td></td></tr>
<tr><td>37.</td><td>Status of pesticide residues in major seasonal fruits
Residue analysis of fruit samples collected from different market places of south Gujarat revealed that 31.67 % out of 120 samples are positive for pesticide presence wherein 9.17 % are found above MRL. Maximum positive samples are detected from Surat market. Carbendazim was the most frequently detected pesticide followed by chlorpyrifos and tebuconazole. Most positive samples are detected in apple and least in sapota. However, banana had most positive samples above MRL. Total 52 pesticides detected in different fruits out of which 29 (55%) pesticides violated label claim fixed by the CIBRC.</td><td>2015-16</td></tr>
<tr><td>38.</td><td>Evaluation of in situ crop residue management on quality and productivity of banana cultivated under organic farming
The farmers of south Gujarat heavy rainfall agro climatic zone- I (AES III) growing banana, variety Grand Nain, organically are advised to apply farm residue along with 2% banana pseudostem sap @ 400 l/ha for achieving higher fruit yield as well as net income.
Detail management
• Planting: Prepared the pits at 1.5 m x 1.2 m x 2.4 m distance and apply the NADEP compost @ 2.0 kg per pit along with Azatobactorand PSB @ 5.0 kg/ha.
• •Add the farm residue @10t/ ha. in equal two splits at the time of two and four monts after planting.
• •Apply 400l/ha 2% banana pseudostem sap on residue and covered the residue by thin layer of soil.</td><td>2015-16</td></tr>
</table>

Sr. No.	Title and Recommendation	Approval Year
	• •Drench 500 ml (0.5%) /plant each of *Trichoderma* and *Pseudomonas* at the time of planting	
39.	**Turmeric, NVST-64 (GNT-2)** A turmeric culture NVST-64 yielded 28.7 t/ha with yield increment of 22.5 % and 26.5 % over checks GNT-1 and Pratibha. It contains more number of mother rhizomes (4-5) per plant, fingers per rhizome (30-34), higher curcumin content (4.10 %), dry weight recovery (20.70%), powder recovery (87.0%) and medium reddish yellow powder colour. Resistant against rhizome rot and moderately resistance against leaf blotch diseases. It is recommended for South Gujarat. The proposal was approved with following suggestions. (Approved in 12th Combined Joint AGRESCO of CISC Meeting held at Navsari during April 11-13, 2016)	**2015-16**
40.	**Niger Variety Gira, NRS 1304** Niger variety NRS-1304 has recorded higher seed yield of 406 kg/ha which was 35.8% and 31.4% increase over the national check IGPN-2004-1 (299 kg/ha) and local check GN-2 (309 kg/ha) respectively. It recorded oil yield of 132 kg/ha which was 53.5% and 36.1% higher over the national check IGPN-2004-1 (86 kg/ha.) and local check GN-2 (97 kg/ha). NRS-1304 also found resistant to the Alternaria and Cercospora leaf spot diseases and moderately resistant to semilooper and caterpillar. It is recommended for South Gujarat. The proposal was approved with following suggestions. (Approved in 12th Combined Joint AGRESCO of CISC Meeting held at Navsari during April 11-13, 2016)	**2015-16**
41.	**Residues and dissipation of deltamethrin 2.8 EC in okra** The okra growers of South Gujarat Heavy Rainfall Agro climatic Zone (AES III) are recommended to observe minimum one day pre harvest interval after the last spray of deltamethrin 2.8 EC when applied @ 0.028% (10 ml in 10 litre water). ભીંડામાં ફળ અને ડુંખના વેધક અને લીલા તડતડિયાના નિયંત્રણ માટે ફળ બેસવાની અવસ્થાએ બે છંટકાવ ૧૦ દિવસના આંતરે કરતા, જંતુનાશકના અવશેષો જોવા મળતા નથી. આથી, દક્ષિણ ગુજરાતના ભારે વરસદવાળા ખેત આબોહવાકીય વિસ્તારના ભીંડા ઉગાડતા ખેડૂતોને ડેલ્ટામેથ્રીન ૨.૮ ઈ.સી. ના ૦.૦૨૮% (૧૦ મી.લિ. પ્રતિ ૧૦ લીટર પાણી પ્રમાણે) ના છેલ્લા છંટકાવ અને ઉતાર વચ્ચે ઓછામાં ઓછો એક દિવસનો સમયગાળો રાખવાની ભલામણ કરવામાં આવે છે.	**2014-15**
42.	**Bio-efficacy of some insecticides against *Helicoverpa armigera* (Hubner) on tomato** For effective control of tomato fruit borer, farmers of south Gujarat (AES III) are advised to apply two sprays of flubendiamide 20 WDG @ 2.5 g/10 l or chlorantraniliprole 18.5 SC @ 3.0 ml/10 l, first at the time of flowering and second at 15 days after first spray for obtaining higher yield and better return. Further, the residue content of this insecticides	**2014-15**

Sr. No.	Title and Recommendation	Approval Year
	remains below MRL in tomato fruits after three days. ટામેટામાં લીલી ઇયળ ના અસરકારક નિયંત્રણ માટે દક્ષિણ ગુજરાત ખેત આબોહવાકીય પરિસ્થિતિ ૩ના ટામેટા ઉગાડતા ખેડૂતોને ભલામણ કરવામાં આવે છે કે ફ્લુબેન્ડીયામાઇડ ૨૦ ડબ્લ્યુડીજી ૨.૫ ગ્રા./૧૦ લી. અથવા ક્લોરેન્ટ્રાનીલીપ્રોલ ૧૮.૫ એસસી ૩ મી.લી./૧૦ લી.નો પ્રથમ છંટકાવ ફૂલ બેસવાની અવસ્થાએ અને બીજો પ્રથમ છંટકાવના પંદર દિવસ બાદ કરવાથી વધુ ઉત્પાદન મેળવી સારૂ વળતર મળે છે. વધુમાં ટામેટામાં આ જંતુનાશક દવાના અવશેષો મહત્તમ અવશેષ મર્યાદાથી ઓછા રહે છે.	
43.	**Residue and dissipation pattern of bifenthrin, fipronil, chlorpyrifos and imidaclorpid in clayed and sandy loam soils and their downward movement and leaching potential** Considering the leaching potential and depthwise distribution and chances of contamination of water, bifenthrin 10 EC, chlorpyrifos 20 EC and fipronil 5 SC should be preferred over imidacloprid 17.8 SL for the control of soil pest in sandy loam and clay soils. Bifenthrin, chlorpyrifos, fipronil and imidacloprid can be used to control soil pest in sandy loam and clay soils due their moderate persistency and strong adsorption in the soil.	**2014-15**
44.	**Evaluation of different extractants and methods for the determination of P and K from soil** The soil analysts are suggested to use AB-DTPA as multi-nutrient extractants and ICP-MS as quantifying instrument to get accurate, precise, rapid and predictable results for P and K analysis in soil.	**2014-15**
45.	**Non Destructive Analysis of Protein, Fibre and Oil in Rice, Pigeon Pea and Soybean by NIR Analyzer** Considering the cost and time of analysis and safety, the laboratory analysts are suggested to use Near Infra-Red analyzer for the accurate and rapid estimation of protein, oil and fibre content from rice, soybean and pigeon pea over routine methods *i.e.* Folin-Lowry method, Soxhlet method and Gravimetric method, when the samples are homogenous in nature.	**2014-15**
46.	**Residues of Some Insecticides in/On Indian Bean Pod** Indian bean growers of South Gujarat (AES-III) are advised to keep waiting period of seven days after spray of thiamethoxam 25 WG (35 g a.i. /ha), novaluron 10 EC (33.5 g a.i. /ha), indoxacarb 14.5 SC (60 g a.i. /ha), spinosad 45 SC (75 g a.i. /ha), acetamiprid 20 SP (20 g a.i. /ha) and flubendiamide 39.35 SC (50 g a.i. /ha) and ten days for imidacloprid 17.8 SL (25 g a.i. /ha).	**2014-15**
47.	**Status of residues of insecticides in/on Indian bean after Ubadia Preparation** The residues of imidacloprid17.8 SL (25 g a.i. /ha), thiamethoxam 25	**2014-15**

Sr. No.	Title and Recommendation	Approval Year
	WG (35 g a.i. /ha), novaluron 10 EC (33.5 g a.i. /ha), indoxacarb 14.5 SC (60 g a.i. /ha), spinosad 45 SC (75 g a.i. /ha), acetamiprid 20 SP (20 g a.i. /ha) and flubendiamide 39.35 SC (50 g a.i. /ha) observed below detectable level in Indian bean after *Ubadia* preparation	
48.	***In vitro* efficacy of isolated probiotic organism** *Enterococcus faecium strain LAB1, Leuconostoc mesenteroides and Leuconostoc pseudomesenteroides* shows the antimicrobial properties as well as produce good quality curd. Thus, these strains can be used for probiotic curd preparation.	**2014-15**
49.	**Residues and dissipation of imidacloprid 17.8 SL in mango** For the control of hopper in mango, need base application of imidacloprid 17.8 SL at 15 days interval @ 3 ml/10 litre water /tree (0.53 g a.i./tree) up to marble stage do not pose residue problem. Considering the MRL of imidacloprid (0.2 µg/g) for mango, PHI of one day is recommended for the harvest of mango under south Gujarat conditions. આંબામાં મધીયાના નિયંત્રણ માટે ફળ લખોટી કદના થાય ત્યાં સુધી જરૂરિયાત મુજબ ઇમિડાક્લોપ્રિડ ૧૭.૮ એસએલ 3 મિલિ/૧૦ લિટર પાણી /ઝાડ (૦.૫૩ ગ્રામ સ.ત./ ઝાડ પ્રમાણે ૧૫ દિવસના આંતરે છંટકાવ કરતા, ફળમાં દવાના અવશેષો જોવા મળતા નથી. ઇમિડાક્લોપ્રિડની કોડેક્ષ પ્રમાણે મહત્તમ અવશેષ મર્યાદા ૦.૨ માઇક્રોગ્રામ પ્રતિ ગ્રામને ધ્યાનમાં રાખીને દક્ષિણ ગુજરાતના ખેડૂતોને છંટકાવ અને ઉતાર વચ્ચે એક દિવસનો સમયગાળો રાખવાની ભલામણ કરવામાં આવે છે.	**2013-14**
50.	**Residue and dissipation pattern of indoxacarb, bifenthrin, fipronil and novaluron in brinjal** Considering the respective Codex MRLs of Indoxacarb 15.8 EC, bifenthrin 10 EC and novaluron 10 EC applied @ 0.22, 0.125 and 0.5 kg a.i./ha respectively, do not pose residue problem in brinjal when harvetsted 1 day after spray. Therefore, pre-harvest interval of 1 day recommendation in brinjal under south Gujarat condition.	**2013-14**
51.	**Residue and dissipation pattern of indoxacarb, bifenthrin, fipronil and novaluron in okra** Considering the respective Codex MRLs of Indoxacarb 15.8 EC, bifenthrin 10 EC and novaluron 10 EC when applied @0.22, 0.125 and 0.5 kg a.i./ha respectively, do not pose residue problem in okra when harvested 1 day after spray. Therefore, pre-harvest interval of 1 day recommended in okra under south Gujarat conditions.	**2013-14**
52.	**Status of insecticide residue in farm gate samples of okra, brinjal and chilli** Farm gate samples of brinjal collected from Navsari (AES-III) found free from 41 pesticides but ome of okra and chilli samples found positive with organophosphate insecticide such as monocrotophos,	**2013-14**

Sr. No.	Title and Recommendation	Approval Year
	ethion and triazophos.	
53.	**Monitoring of pesticide residue in market samples of okra and brinjal** Market samples of brinjal obtained from different talukas of Navsari, Surat and Tapi district were free from pesticide while that of okra samples were positive with organophosphate insecticides among them, monocrotophos was frequently detected.	**2013-14**
54.	**Evaluation of the drinking water of Navsari and surroundings** Potable water samples collected from the Navsari and its surroundings were free from 41 pesticides while other chemical properties were under the acceptable limit *Escherichia coli* (bacteria) were etected across the seasons but found higher in winter followed by monsoon and summer seasons.	**2013-14**
55.	**Analysis of the microbial contaminant and adulteration in milk** The pasteurized milk samples procured from Navsari and its surrounding places found excellent to good while some of the raw milk samples were poor from the microbial quality point of view, across the seasons. Some of the raw milk samples were found positive with *Escherichia coli* (bacteria) out of which maximum positive samples were in winter followed by monsoon and summer. None of the pasteurized milk sample found positive with *E. coli* and none of the milk samples were found positive to chemical adulterant.	**2013-14**
56.	**Qualitative analysis of mango varieties, Kesar and Alphonso** The nutritional quality of mango varied with variety, crop management practices under south Gujarat condition. The findings is mentioned below: • Nutritional quality of Alphonso and Kesar was more or less same but Fe, Mn, Zn, P, K, Ca, Mg, and Na contents were higher in Alphonso. • Organically grown mango was superior in protein, total antioxidant capacity, vitamin-C, folic acid, P, K, Mg, Fe, Mn, Zn and Cu content than inorganically grown mangoes. •Total antioxidant power, vitamin-C, folic acid, Ca and Cu content in non-irrigated mango were higher than irrigated mango.	**2013-14**
57.	**Isolation and identification of lactic acid bacteria and their various biochemical activity** Fourteen microorganisms were isolated from khira of dhokla and khaman samples and preliminary study reveals that, among them ten isolates belongs to Lactobacilli and remaining were yeast.	**2012-13**

E. Publications

Sr. No.	Publications	Total
1	Practical manuals	10

2	Research papers	40
3	Popular articles/ Review articles	08
4	Books/ Book chapter	14