DEPARTMENT OF ENTOMOLOGY
NAVSARI AGRICULTURAL UNIVERSITY
CAMPUS BHARUCH-392012

1. MANDATE:

The Department of Entomology is one of the most important component of College of Agriculture.The discipline has major share with the problems regarding pests particularly in pigeonpea, cotton and pulse crops.

1. To impart the education at undergraduate and postgraduate level
2. To upgrade the knowledge, skill and different principles regarding the current pest problems of the farmers in entomological field.
3. To conduct the various research experiments/projectssponsored by State Government, ICAR, Private Pesticide Companies, other agencies etc.
4. Providing diagnostic services to the farmers for insect pests infesting different crops.
5. Providing knowledge to the farmers for insect pests infesting different crops and its management through TV talk, radio talk, video conference *etc.*
6. To develop the pest management technologies for farmers and scientific communities.
7. To transfer the recommended technologies to farmers through literature distribution, and publication of popular articles, leaflets, folder *etc.*in newspaper and magazine*etc.*
8. Training on pest management during training programs organized by Director of Extension, State Agricultural Department, NGO, KVK and other extension agencies.
9. Publication of extension literatures (Popular articles, leaflet, folder etc.) on Pest Management.
10. Publication of research related to insect pests and its management carried out in the Department.

2. OBJECTIVES:

1. To upgrade the knowledge, skill and different principles regarding the current pest problems of the farmers in entomological field.
2. To impart the education at U.G. and P.G. level.
3. To conduct the various research experiments approved by Plant Protection Sub Committee in AGRESCO and other agencies.
4. To develop the pest management technologies for farmers and scientific communities.
5. To transfer the recommended technologies to farmers through literature distribution, popular articles in news paper and training etc.

3. MAJOR ACTIVITIES:

1. Teaching:

(a) Under graduate:

Courses of Entomology in B.Sc. (Hons.) Agri. (5th Dean Committee)

Sr. No.	Semester	Course Number	Title of course	Credits
1	3rd	Ag. Ento. 3.1	Fundamentals of Entomology	2+1
2	4th	Ag. Ento. 4.2	Principles of Integrated Pest Management	1+1
3	4th	Ag. Ento. 4.3	Management of Beneficial Insects	1+1
4	5th	Ag. Ento. 5.4	Pest of Field Crops and Stored Grains and	1+1

			their Management	
5	6th	Ag. Ento. 6.5	Pests of Horticultural crops and their management	1+1
6	7th	Ag. Ento. 7.4	RAWE Programme	0+2

Courses of Entomology in B.Sc. (Hons.) Agri. (6th Dean Committee)

Sr. No.	Semester	Course Number	Title of course	Credits
1	1st	Ent. 1.1	Fundamentals of Entomology	2+1
2	5th	Ent. 5.2	Pest management in Crops and Stored Grains	2+1

(b) Post graduate teaching:

Courses of Entomology in M.Sc. (Agri.) (As per BSMA)

Sr. No.	Course No.	Course Title	Credit
1	ENT 501*	Insect Morphology	3 (2+1)
2	ENT 502*	Insect Anatomy and Physiology	3 (2+1)
3	ENT 503*	Insect Taxonomy	3 (1+2)
4	ENT 504*	Insect Ecology	3 (2+1)
5	ENT 505*	Biological Control of Insect Pests and Weeds	3 (2+1)
6	ENT 506*	Toxicology of Insecticides	3 (2+1)
7	ENT 507	Host Plant Resistance	2 (1+1)
8	ENT 508*	Concepts of Integrated Pest Management	2 (2+0)
9	ENT 509*	Pests of Field Crops	3 (2+1)
10	ENT 510*	Pests of Horticultural and Plantation Crops	3 (2+1)
11	ENT 511*	Post-Harvest Entomology	2 (1+1)
12	ENT 591	Master's Seminar	1 (0+1)
13	ENT 599	Master's Research	30 (0+30)

(c) Polytechnic in Agriculture:

Courses of Entomology in Polytechnic in Agriculture

Sr. No.	Semester	Course Number	Title of course	Credits
1	1st	Ag. Ento. 1.1	Fundamentals of Entomology	2+1
2	2nd	Ag. Ento. 2.2	Principles of Integrated Pest Management	2+1
3	3rd	Ag. Ento. 3.3	Pests of Field crops and Stored grain and their management	2+1
4	4th	Ag. Ento. 4.4	Pest of Horticultural crops and their management	2+1

Ph.D. Students:

Sr. No.	Name of student	Title of Thesis	Name of Major Advisor	Year of Award of Degree
1	Bhadani Dhavalkumar Jaysukhlal	Morphological and Biochemical Basis of Resistance against pod borer complex in pigeonpea, *Cajanus cajan*(L.) Millspaugh	Dr. J. J. Patel	2019
2	Berani Nikulkumar Khodabhai	Pest succession and sources of resistance against brinjal pest complex	Dr. J. J. Patel	2020
3	Muchhadiya Dipakkumar Vasrambhai	Population dynamics, varietal screening and management of pod borer complex in cowpea [*Vigna unguiculata* (L.) Walp.]	Dr. K.G. Patel	2020
4	Prajapati Atulkumar Pravinbhai	Comparative biodiversity of insect and mite in organic and conventional farming systems of Bottle gourd (*Lagenaria siceraria* (Molina) Standl.	Dr. J. J. Patel	2022
5	Patel Piyushkumar Hasamukhbhai	Succession and management of major pests of summer green gram [*Vigna radiata*(L) Wilczek]	Dr. J. J. Patel	2023
6	Senjaliya Tushar Mukeshbahi	Eco-friendly management of thrips (*Thrips tabaci* Lindeman) infesting onion	Dr. J. J. Patel	2024

M.Sc. Students:

Sr. No.	Name of student	Title of Thesis	Name of Major Advisor	Year of Award of Degree
1	Nilam Raghunath Bangar	Management of shoot and fruit borer, *Eariasvittella (*Fabricius) and residue status of some insecticides in/on okra, *Abelmoschus esculentus* (Linnaeus) Moench in summer	Dr. J. J. Patel	2011
2	Himansu Chandrakant Patel	Population dynamics, varietal susceptibility and management of thrips [*Thrips tabaci* Lindeman] in Onion (*Allium cepa* Linnaeus)	Dr. J. J. Patel	2011
3	Parth Bharatbhai Patel	Population dynamics, varietal susceptibility and management of thrips (*Thrips tabaci* Lindeman) in garlic (*Allium sativum* Linnaeus)	Dr. J. J. Patel	2011
4	Mayur V. Variya	Varietal Susceptibility and management of leaf miner (*Liriomyzatrifolii* Burgess) in tomato	Dr. J. J. Patel	2012
5	Bhavik V. Barot	Eco-friendly management of thrips, *Scirtothrips dorsalis* (Hood) in chilli, *Capsicum annum* L.	Dr. J. J. Patel	2012
6	Arif A. Shaikh	Management of sucking pests in brinjal [*Solanum melongena*	Dr. J. J. Patel	2012

		Linnaeus]		
7	Mr. Jalondhara Rasik Maganbhai	Succession of insect pests and management of pod boring insects in pigeonpea*Cajanus cajan* (L.) Millsp	Dr. D. R. Patel	2015
8	Prabhatkumar S. Patel	Incidence of thrips in organic onion and its management	Dr. J. J. Patel	2016
9	Patel Jigneshbhai Dhanajibhai	Effect of sowing date on population of pest complex of pigeonpea*Cajanuscajan* (L.) MILLSP.	Dr. D. R. Patel	2016
10	Rajesh M. Makvana	Succession of major pests, varietal screening and effect of spacing and organic fertilizer on cowpea pod borer	Dr. J. J. Patel	2017
11	Priyanka J. Patel	Population dynamics, varietal screening and bio-efficacy of insecticides against sucking pests in summer okra	Dr. J. J. Patel	2017
12	Patel Divyesh Narsinhbhai	Seasonal incidence of major insect pests of cauliflower and management of diamond back moth,*Plutellaxylostella*(Linnaeus)	Dr. D. R. Patel	2017
13	Hadiya Hiteshkumar Ranabhai	Effect of sowing date on pest complex of mungbean [*Vigna radiata*(L.) Wilczek]	Dr. D. R. Patel	2018
14	Nikhil Pravinchandra Trivedi	Diversity of aphids and their host plants under South Gujarat condition	Dr. J. J. Patel	2019
15	Rojasara Asmita Dhanjibhai	Biology and management of rice weevil, *Sitophilus oryzae* Linnaeus on paddy	Dr. D. R. Patel	2019
16	Vaidik Devashrayee	Seasonal abundance, varietal screening and Bio efficacy of insecticide against pest complex of Indian bean	Dr. D. R. Patel	2020
17	Pansara Zeel Hareshbhai	Population dynamics and management of red and black pumpkin beetle (*Aulacophora foveicollis* Lucas) on cucumber (*Cucumis sativus* Linnaeus.	Dr. J. J. Patel	2021
18	Balai Yagnesh M.	Population dynamics and management of pest complex of sesame (*Sesamum indicum* L.)	Dr. D. R. Patel	2021
19	Antala Dhruv Hansrajbhai	Population dynamics, varietal screening and chemical control of pod borer, Helicoverpa armigera (Hubner) Hardwick in chickpea	Dr. D. R. Patel	2022
20	Makvana Laljibhai Lakhabhai	Population dynamics and management of sucking pests complex of *Bt* cotton	Dr. D. R. Patel	2022
21	Rankja Jigarkumar Nathalal	Population dynamics and management of major insect-pests infesting green gram (*Vigna radiata* L.)	Dr. D. R. Patel	2023

22	Bavaliya Dineshbhai Gordhanbhai	Population dynamics and management of sucking pests of moth bean [*Vigna aconitifolia* (Jacq.) Marechal]	Dr. D.V. Muchhadiya	2024
23	Thakor Bhagyeshkumar Bhanubhai	Population dynamics and management of major pests of blackgram, *Vigna mungo* (Linn.)	Dr. D. R. Patel	2024
24	Makwana Parthkumar Thakarshibhai	Population dynamics and management of sucking pests of cowpea [*Vigna unguiculata* (L.) Walp.]	Dr. D.V. Muchhadiya	2025
25	Patel Hanishkumar Vishnubhai	Eco-friendly management of pulse beetle, *Callosobruchus chinensis* Linnaeus infesting stored green gram	Dr. D. R. Patel	2025
26	Malik Sabina Abdulmajid	Population dynamics and management of two spotted spider mite, *Tetranychus urticae* Koch in okra	Dr. J. J. Patel	2026

4. RESEARCH ACTIVITY:

Ongoing experiments

S.No.	Title of experiment
1	Screening of SSVT(E)/ LSVT(E)/SSHT(M)/LSHT(M) pigeon pea genotypes against pod borers and pod fly
2	Screening of AVT(E) pigeon pea genotypes against pod borers and pod fly
3	Screening of PET pigeon pea genotypes against pod borers and pod fly
4	Screening of LSVT (M) pigeon pea genotypes against pod borers and pod fly
5	Evaluation of biopesticides against pod borers infesting blackgram

RESEARCH RECOMMENDATIONS:

Sr. No.	Title and Recommendation	AGRESCO No. & Year
1.	***Helicoverpa armigera* moth catches in pigeonpea through sex pheromones** The peak activity of moths and larvae of *Helicoverpa armigera* in pigeonpea were showed during mid of November to March and end of October to December, respectively. Seasonal & yearly moth and seasonal larval activities of *H. armigera* were significantly negatively correlated with minimum temperature, morning & evening relative humidity, rainfall and rainy days, while it was significantly positive correlated with sun shine hours. *H. armigera* moths were significantly negatively correlated with maximum temperature and wind speed during crop season and year, respectively. Seasonal larval incidence and moth catches of *H. armigera* were showed significantly positive correlation.	10th (2014)

<table>
<tr><td>2.</td><td>Population dynamics of major insect pests of sapota
Chiku moth, bud borer, leaf miner, mid rib folder and fruit fly remain active round the year under Agro climatic zone- II, AES- V indicating their peak in 1st fortnight of September, 2nd fortnight of September, 1st fortnight of December, 1st fortnight of November and 2nd fortnight of July, respectively.</td><td>12th (2016)</td></tr>
<tr><td>3.</td><td>Monitoring of fruit fly in mango orchard
The fruit flies remain active round the year under Agro climatic zone – II, AES- V in mango orchard with peak population during the 2nd week of July (28th SMW).</td><td>12th (2016)</td></tr>
<tr><td>4.</td><td>Evaluation of insecticides against chiku moth, Nephopteryx eugraphella R.
For effective management of chiku moth in 6sapota, apply three sprays of either flubendiamide 39.35 SC @ 0.0096% (2.4 ml/10 litre) or emamectin benzoate 5 SG @ 0.0022% (4.4 gm/10 litre) at one month interval during fruiting stage for higher yield and better return. The residues of these insecticides remain below determination level in sapota fruits.</td><td>12th (2016)</td></tr>
<tr><td>5.</td><td>Evaluation of insecticides against pod bug, Clavigralla gibbosa Spinola in pigeon pea cv. Vaishali
Two sprays of any of the following insecticide at an interval of 15 days commencing at pod formation stage are effective to control pod bug, Clavigralla gibbosa Spinola in pigeon pea.
Imidacloprid 17.8 SL @ 0.005 %
Acetamiprid 20 SP @ 0.004%
Thiacloprid 24 SC @ 0.024%</td><td>13th (2017)</td></tr>
<tr><td>6.</td><td>Survey and surveillance of major insect pests of pigeon pea at College Farm, Bharuch as well as Narmada district
The pigeon pea pests were active round the year under Agro climatic zone II, AES V with higher activity period mentioned as under with standard meteorological week (SMW).
<table><tr><th>Pest</th><th>Higher Activity</th></tr><tr><td>Aphid</td><td>36, 38, 39, 45 and 46th SMW</td></tr><tr><td>Jassid</td><td>37, 38, 39, 43 , 47 and 48th SMW</td></tr><tr><td>PSB</td><td>49th to 2nd SMW</td></tr><tr><td>MBDR</td><td>45th SMW</td></tr><tr><td>Helicoverpa sp.</td><td>47th to 50th SMW</td></tr><tr><td>Maruca sp.</td><td>48 and 49th SMW</td></tr><tr><td>Leaf Roller</td><td>41st to 43rd SMW</td></tr></table></td><td>13th (2017)</td></tr>
<tr><td>7.</td><td>Evaluation of acaricides against pigeonpea eriophyid mite, Aceria cajani
Three sprays of spiromesifen 22.9 SC @ 0.005% (2 ml/10 lit) or fenazaquin 10 EC (10 ml/ 10 lit) @ 0.01% at 25, 40 and 55 days after sowing which effectively control pigeonpea eriophyid mite, Aceria cajani and give higher seed yield and net return. Further, the residues of these acaricides were found below determination level in pigeonpea seeds and plant residue.</td><td>14th (2018)</td></tr>
</table>

8.	**Screening of pigeon pea genotypes against pod borer and pod fly under natural field condition** Infestation of pod borers and pod fly was less in the pigeon pea entries *viz*., NPEK-15-03, NPEK-15-25, ICPL-87119, NPEK-15-09, BP-15-23, GJP-1303, SKNP-1413, AGT-2 and BP-15-11.	16th (2020)
9.	**Estimation of yield losses caused by insect pests on pigeonpea (*Cajanus cajan* (L.) Millsp.)** The avoidable yield loss in pigeonpea is recorded up to 38.48 per cent (35-40 %) by insect- pests when no plant protection measures are taken. The maximum damage is recorded due to pod borer (*Helicoverpa armigera*) followed by pod sucking bugs (*Clavigralla gibbosa*) and pod fly (*Melanogromyza obtusa*).	17th (2021)
10.	**Management of pod fly, *Melanagromyza obtuse* (Mollach) in pigeonpea (Recommendation for farming community)** The pigeon pea growers are recommended to follow the following IPM strategy for reducing pod fly infestation as well as in gaining higher grain yield with low input cost. • Interspersing of sorghum and maize @ 1% • Installation of trap baited with 20 ml ethanol @ 20/ha during 50% flowering up to maturity and during this duration recharge traps at 15 days interval • Application of NSKE @ 5% at 5 day old age pod period followed by emamectin benzoate 5 SG @ 0.0011% (2.2g /10 lit.) and acetamiprid 20SP @ 0.004 (2.0g /10 lit) at 10 days interval **Trap Details:** For preparing a trap 1 litre plastic water bottle will be used and underside of it will be wrapped with white paper. The middle portion of bottle is to be cut in 2x2 inch size for inserting a 20 ml ethanol suspended plywood block which remains hang in the bottle.	17th (2021)
11.	**Morphological basis of resistance in pigeonpea (*Cajanus cajan* (L.) Millspaugh) against pod borer complex** Among the twelve pigeonpea genotypes/cultivars screened, BP-17-02 was found highly resistant and BP-16-182, BP-16-228, BP-16-261, ICPL-87119 and BP-16-166 were found resistant whereas, GNP-2 and Vaishali were found highly susceptible against pod borers. Genotypes/cultivars having short pod length, narrow pod breadth, narrow seed breadth, more seeds/pod, more seed weight, more seed density, thick pod wall thickness and long trichome length recorded lower pod borers population. Pod length had a significant positive correlation with *Maruca vitrata*, *Exelastis atomosa* and pod fly damage. Significant positive association was found between pod breadth and larval population of *Helicoverpa armigera* and *Maruca vitrata*. Significant negative correlation was found between *Exelastis atomosa* and pod wall thickness. Genotypes/cultivars viz., BP-16-178, ICPL 87119, BP-16-182, BP-16-228 and BP-16-183 were found resistant to pod fly.	20th (2024)
12.	**Evaluation of biopesticides against pod borers infesting greengram** Apply three sprays of azadirachtin 0.15 EC at 0.0006% @ 40ml/10 lit of water, first spray at initiation of pod borers (*Helicoverpa armigera* and *Maruca vitrata*) and subsequent two sprays at 10 days interval for effective management of pod borers in greengram.	20th (2024)