

A DIALOGUE

WITH DR. BASAVARAJ VEERANAGOUDA PATIL

The best IPM specialist, teacher , administrator and eminent cotton IPM specialist who made significant contributions in the cotton pest management.

Dr. B. V. Patil shares his thoughts and experiences with Dr. A. Prabhuraj (AP), Associate Editor of IE.



After completing his PUC education, as per the wishes of his father who was a successful farmer joined Agriculture Collage, Dharwad even though, he was selected for medical seat at KMC, Hubli. With ICAR merit fellowship Dr. Patil completed his graduation and joined M.Sc. (Agri.) in Agricultural Entomology at Dharwad itself by securing 3rd rank in ICAR junior fellowship. He worked on the Role of light traps in survey and monitoring the activity of lepidoptrous pests and continued his education by joining PhD programme at Dharwad though he had secured a PhD seat in IARI, New Delhi. This decision was mainly influenced by Dr. S.V. Patil, then DI (PGS) whom he considered as his mentor, advisor and well-wisher who asked him to work on teak skeletonizer, *Eutectona machaeralis* Walker. Dr. B.V. Patil made detailed studies on its bio-ecology, life table construction to identify the key mortality factors and management using egg parasitoid, *Trichogramma chilonis* and published research papers in National and International journals and completed PhD with University gold medal.

After completing PhD programme, he immediately joined for the permanent post of Research Assistant at Regional Research Station, Raichur in August 1980. He worked on Groundnut and Castor Pests Management and identified many parasitoid complexes in these ecosystems in a collaborative research

Dr. Basavaraj. V. Patil was born on 1st March, 1955 to Sri. Veeranagouda Patil, an agriculturist and Smt. Saraswathemma Patil, a housewife in Kalyana Karnataka in village Hireyerdhihal of Lingasagur taluka Raichur district. Dr. B. V. Patil had his early school education at his village, Mudgal and Bagalkot till 5th standard. Dr. Patil had five brothers and two sisters and his father had a great desire to educate all his sons and daughters hence, put them in a very good schools. But, Dr. B.V. Patil only could fulfil his father's desire as he continued his studies further from 6th to 12th standard at Ramakrishna Residential Vidyashala, Mysore, one of the best education centres even today. His study at this school made him an all-round student securing second highest marks of 79% in PUC that fetched him 'Best Outgoing student' award for his curricular and extracurricular activities such as sports representing school at Mysore Junior level.

project with ICRISAT, Hyderabad and published an important catalogue on Groundnut leaf miner and its parasitoid complex which received a good recognition. Later, he was selected for Assistant Entomologist post and moved to Regional Research Station, Bijapur and worked on Sorghum and Bengal gram in rainfed ecosystem. He developed low-cost technology for shoot fly management and on intercrops strategies for Bengal gram pod borer management. He was later selected for Associate Professor of Entomology and posted as Entomologist (Cotton) at premier Agriculture Research Station, Hebballi, Dharwad to work on cotton. During this period, he developed good contact with the entire cotton entomologists and also with the entire product development managers of different pesticide companies and tested their new products and recommended to cotton farmers. He developed IPM schedule for dry land cotton which was successfully test verified in the farmers' fields. After 5 years of work at this station, university posted him as in-charge professor of Entomology at newly established collage of Agriculture, Raichur during 1987. This gave him an opportunity to involve himself in teaching in addition to continue his research work on irrigated cotton pest management. Sooner he was selected for post doctorate programme under commonwealth academic staff fellowship programme at Southampton University, UK to work on sex pheromones with one of the world's renowned scientist Dr. Peter Lewis at his chemical Entomology Laboratory. He learnt the insect rearing techniques for pheromone isolation, standardization for their combination and testing under laboratory conditions through wind tunnel experiments. He also spent few months at Imperial college, London for better understanding of IPM principles and its implementation strategy under the guidance of Dr. G.A. Mathews.

After returning from England, he became regular professor at the Department of Entomology, Collage of Agriculture, Raichur and within short time developed very good infrastructure and equipments in the Department. This helped to attract meritorious students

to undertake M.Sc. (Agri.) programme in Entomology. During this time irrigated cotton had an outbreak of cotton whitefly; *Bemisia tabaci* and bollworm, *Helicoverpa armigera* which threatened cotton cultivation resulting in a great economic loss to the farmers. Dr. B.V. Patil with his colleagues and students took up series of research studies and developed management strategies for whiteflies and bollworms and demonstrated on the Research Station and also in farmers' fields. He had an operational research project on IPM and demonstrated in 250 acre area successfully with maximum seed cotton yield and higher net profit which became very popular nationwide and made him to recognise as an eminent cotton Entomologist of the country. During this time he also collaborated and worked on *H. armigera* management on Redgram at Gulbarga area till 2002. Later, he took up higher administrative work in addition to continuing his research and teaching work concurrently as Associate Director of Research at RRS, Raichur later as Director of Instructions (Agri.) at college of Agriculture, Raichur. Later in August 2008 he was selected as Director of Research, UAS, Bangalore and developed good coordinated research programmes in a short span of time and learnt corporate culture of working and implementing the things.

Government of Karnataka selected him as a Special Officer in February 2009 and gave the responsibility of developing the new Agricultural University at Raichur covering six districts of Kalyan Karnataka. Later, he went on to become the founder Vice-chancellor of UAS, Raichur in April 2010 for four years and after the completion continued as Director of Education, UAS, Raichur from May 2014 to February 2017 before his superannuation.

Dr. B. V. Patil published more than 200 research papers in reputed peer reviewed journals of national and international standards. Under his guidance, 30 M.Sc. and 10 Ph.D. Entomology students have completed their research programmes. Dr. Patil completed more than 30 research projects and visited 22 countries. He

has organized one winter school on IPM, and series of short courses to Department of Agriculture officers on pest management. He is a permanent member of Fellow of Royal Entomological Society and was appointed as 'Cotton whitefly expert' from Govt. of Iran during 2000. He was an FAO consultant for Thailand and Vietnam during 2001 besides being QRT/RAC chairman for various ICAR institutions like PDBC, CICR and NCIPM and life member of national societies like Entomological Society of India, Acarological Society of India, Plant Protection Association of India, Soil Biology and Ecology Society of India etc. Currently he is serving as RAC chairman for NABIR, Bengaluru and member of Advisory committee of PJTSAU, Rajendranagar, Hyderabad.

He has several awards and recognitions to his credit. To name a few, he is the recipient of "Professional Excellence Award- 2018" by Cotton Research & Development Association, Hisar, Haryana, "Lifetime Achievement award – 2016" by AIASA/ ICAR, "Dr. M. Puttarudraiah Endowment" award during 2002, "Dr. C. V. Raman young scientist" state award during 2000 and ICAR "Outstanding Teacher award" during 1998-99.

Dr. A. Prabhuraj (AP): *Briefly tell us about your motivation to choose subject "Agriculture in general and entomology in particular"*

Basavaraj V Patil (BVP): My first motivation is my father who hails from an agriculture family and being a successful farmer always wanted me to study agriculture and improve the production and productivity with improved technologies and practices. My second motivation is Late Dr. Katigihallimath, a renowned extension entomologist of Karnataka state who happens to be my father's close friend. After my PUC, my father took me to him and he motivated me to pickup agriculture subject quoting many successful cases. He was the principal of District Agriculture Training Centre, Bagalkot and later became state Entomologist. Later, during my undergraduate study period, I met Dr. Katigihallimath and use to discuss with

him about farmers' problems caused by insect pests. Those interactions gave me a thinking to specialize in Entomology so that I can also suggest immediate solutions to farmers' problems directly. Further, a course on "Crop pests and their Management" offered by Dr. C.A. Viraktamath impressed me to a greater extent to pursue Entomology as major subject in final year. I got 3rd rank in ICAR junior fellowship and preferred UAS, Dharwad College which had excellent teachers like Dr. C.A. Viraktamath, Dr.Gubbaiah, Dr. B. N. Vishwanath and Dr. Rajagopal. After completing my M.Sc. (Agri.) programme, though I was selected for PhD at IARI, New Delhi, joined at Dharwad. This was mainly because of my well-wisher, mentor and advisor, Late Dr. S. V. Patil DI (PGS) to whom I have great respect.

AP: *Can you tell us the entomological fields of your interest and what motivated you to specialize in Integrated Pest Management "IPM"*

BVP: In the beginning of my carrier, I was interested to work on insect ecology, biological control and pest management. As a Research Assistant, when I was working with Late Dr. H.K. Sangappa, I understood that all the fields of entomology have to be integrated properly to combat the pest complex in any cropping



Dr. BVP with Dr. AP in the cotton field

ecosystem. This finally resulted in my thinking to work on Integrated Pest Management (IPM) which basically includes all the possible economic and effective methods of insect pest control.

AP: Tell us about the challenges you faced while developing IPM of different crops and its implementation in farmers' field.

BVP: The library facility was not so good at Raichur and Bijapur campuses in 1980, hence, I was forced to go to Dharwad and Bangalore campuses often for reviewing the latest literature on the research developments on cotton, oil seed and rabi crops like sorghum, bengal gram and safflower. This was one of the major drawbacks I faced. After shifting to Dharwad as an Entomologist in AICCIP cotton scheme, this problem was overcome and not only I had the opportunity of visiting other cotton research centres but also interacted with other cotton entomologists across India. This gave me lot of boost for developing suitable IPM components based on their availability and cost economics under both dry land and irrigated cotton ecosystem. At Hebballi farm, I had the opportunity to meet and discuss with Sri G. Thimmaiah our senior cotton Entomologist and he exposed me many field problems besides giving suggestions on how to overcome those. All these helped me to develop a separate IPM schedule for rainfed and irrigated cotton ecosystem. Initially, I demonstrated the same in Raichur station over two acre area with good success. The next challenge was to conduct field demonstrations in the farmers' field. It was very difficult to get farmers' field and their cooperation as they were totally dependent on pesticide application on weekly schedule. I was forced to make an agreement with farmers that any yield loss in the IPM demonstration field will be compensated. I could take this risk because I had confidence that the IPM schedule work very well. For two years with the help my colleagues from other subjects, I demonstrated the success of IPM in 5 to 10 acre area in different locations of Dharwad and Raichur with higher seed cotton yield and maximum net profit to the farmers. One thing, I learnt was that we have to demonstrate Integrated Crop Management (ICM) which includes Integrated Pest Management (IPM) in farmers' fields as they are interdependent to get maximum yield and net profit.

AP: Please share your experience on promoting IPM of cotton in Raichur in collaboration with Cotton Corporation of India.

BVP: When we got success of 18% increase in seed cotton yield and 32% net profit under irrigated conditions in limit area of 5-10 acres, a thought came to us that such demonstrations can be further increased to large area in a continuous block as efficiency of bio-control agents can be increased and cost economics can be further improved. IPM schedule developed by me and my colleagues attracted the attention of other cotton centres of AICCIP scheme across the country and they also implemented with little variation to suit to the local condition in north, central and southern parts of India. Dr. A.K. Basu, Former Director of Central Institute of Cotton Research, Nagpur and the Advisor to Cotton Corporation of India (CCI) Mumbai suggested me to submit a project in this regard for implementation in large area. Based on his suggestion, I along with other cotton scientists at RRS Raichur submitted an ICM project with emphasis on IPM for implementation in 250 acres of continuous block under irrigated ecosystem around Raichur. The project was sanctioned for Rs.25 lakhs. Then, I had to face real problem of convincing farmers of 250 acres in one block which included 52 farmers as they were not ready to take any risk of getting seed cotton yield below 12 quintals and for this they were applying pesticides of all combinations at almost weekly basis. However, based on my earlier experience we made an agreement that maximum of 12 qt of seed cotton yield will be assured per acre in this 250 acre demonstration block and otherwise it will be compensated with the cost of inputs required for next year. For this agreement all the farmers agreed and cooperated to the maximum extent. Five B.Sc. (Agri.) graduates were appointed on contract basis and were trained on IPM schedule to monitor the insect pest population and implementation of IPM schedule giving them proper mobility. Continuous efforts for five months in the project area resulted in obtaining an average 15.3 qt of seed cotton yield per acre with reduction of 40% pesticide application and an increase of 52% net prof-

it per acre to each farmer. We conducted a field day to which over 2000 cotton farmers from different cotton growing areas of Karnataka and Andhra Pradesh participated along with dignitaries from both central and state governments, ICAR and Entomologists of AICCIP scheme on cotton to showcase the success of the project. Our farmers had a great interaction with other farmers and officials. We even brought out at a booklet on highlighting the success of this project.

AP: Can you highlight important IPM programmes you developed on crops other than cotton in Karnataka?

BVP: Though my major work was on cotton, I also had the opportunity of interacting with Redgram and Groundnut entomologists as a senior person in developing IPM schedule. Based on my knowledge and with the help of post graduate students, we developed IPM schedule for pest complex in Redgram and Groundnut. Similar large-scale demonstrations upto 100 acres was taken up in Redgram and 50 acres demonstration in Groundnut ecosystem. These demonstrations also gave tremendous success in increasing the yield and reducing the cost of plant protection. One of the important things that happened in Redgram ecosystem was development of *pest prediction model* in collaboration with ICRISAT, Hyderabad based on light trap and pheromone trap catches data of *Helicoverpa* available over 15 years at ARS Gulbarga by integrating with rainfall pattern. The accuracy of the prediction of *Helicoverpa* incidence was to the extent of 80%. With the help of officers of the Department of Agriculture regular monitoring of the field incidence of the pest was initiated in Redgram under my supervision and suitable management strategy was suggested to the farmers. This became very popular not only in Karnataka but also throughout Redgram growing areas of the country and was called as “Gulbarga Model” for *Helicoverpa* management on Redgram.

AP: You have excelled both as a teacher and re-

searcher in entomology. please share your teaching experience?

BVP: As cotton entomologist, I was offering one PG course “Insect Ecology” at the Department of Entomology, Agriculture Collage, Dharwad. But my real commitment of teaching started when I was posted as In-charge professor of Entomology in newly established Agriculture collage, Raichur. In the beginning I used to spend lot of time in developing the Department with course content suitable for practical classes with audio-visual aids and equipments required for undergraduate courses with the help of my colleagues who were very cooperative. I was teaching one course “Crop pests and their management” regularly wherein I had the opportunity of motivating many good students to take up entomology as their major subject. With the help of my colleagues, I took special classes in entomology for preparing them for competitive examinations like ICAR junior fellowship conducted by ASRB, New Delhi. Because of this, every year 1-6 students could get through the exam and in 1992 our Department could get 1st, 3rd, 5th, 6th, 10th and 13th rank at All India level. This prompted UAS, Dharwad to start a PG programme in Entomology at Raichur. With the help of entomologists placed in research and extension, I managed PG programme very efficiently. I requested my colleagues to develop their own specialization in Entomology based on their interest and this helped to teach effectively different courses in PG programme. I got many research projects and also good number of insecticide molecule testing projects which helped to develop the Department with good number of latest materials and equipments required for student’s PG research. Because of all this many of our PG students got ICAR senior fellowships for their PhD programme and few of them joined ARS, ICAR scientist position, Universities as teachers, scientists and extension workers, Officers in Department of Agriculture, Government of Karnataka and many have joined pesticide companies in R&D and sales division.

AP: *What are the innovative teaching techniques you adapted to enhance learning abilities in students of entomology?*

BVP: When I was doing my post-doctoral programme at the University of Southampton, England during 1987-88, I also had the opportunity to attend many postgraduate classes taken by experts like Dr. Philip. House, Dr. Edward and Dr. G Williams on semio chemicals, pest management, insect ecology and insect systematics. I picked up some of the teaching skills like group discussions among students on a particular subject, practical experience on student's presentation by giving abstract of the next class on a particular subject, scope for students asking the questions during the class hour itself and making other students to answer if they know otherwise giving the answer as a course teacher which improves their thinking capacity etc. I adopted some techniques for PG programme and maximum practical exposure for UG students such as taking students to fields of specific crops and asking them identify the causal organism based on the nature of damage and symptoms of damage. Similarly, assigning PG students to carry out crop survey and record the insect pests, their damage and quantifying the incidence and working out economic threshold level for the management. Visiting farmers' fields of different crops and encouraging PG students to involve in discussion with farmers and suggesting remedial measures. I use to update all the latest audio-visual aids and digital teaching tools along with other colleagues for effective teaching for UG & PG students. I use to involve PG students in sorting out insects collected by UG students and then separating on taxonomic basis and on crop pests' basis which helped the students to remember forever.

AP: *Tell us in brief about the infrastructure in cutting edge technologies you developed in the field of Entomology?*

BVP: For different courses in Entomology, infrastructure and equipments required for teaching was made by purchasing out of university grants, ICAR

PG grants and Adhoc projects in addition to conduct of research by students and faculty. For insect ecology studies, BOD incubators of different capacities, Walk-in growth chambers, thermo-hygrometers and for toxicology studies, potter's tower, micropipette applicators etc. and for semio-chemical studies, Electro antennogram (EAG), olfactometer and wind tunnel etc. and bionocular/trinacolor stereozoom microscopes with image analyzer were purchased. For Sterile Insect Technique (SIT) studies, gamma radiation chamber was established with the help of BARC, Mumbai. For climate change studies Open top chambers with temperature and CO₂ regulation, automatic weather station etc. were established. For pesticide residue studies a state-of-art Pesticide Residue and Food quality analysis laboratory (PRFQAL) was built with the financial aid from RKVY grants and GOI grants. The laboratory has high end equipments like LC-MS/MS, GC-MS/MS, ICP-MS, UHPLC etc.

AP: *Another important dimension of your personality is an outstanding administrator. You have reached the highest administrator position as Vice-chancellor of UAS, Raichur. please share your administrative experience.*

BVP: In administration lot of infrastructure facilities like the establishment of smart classrooms, Upgradation of laboratories, hostels, library and staff quar-



Dr. BVP with Dr. AP observing cotton pests

ters in different campuses were built. Priority was given to beautification of main and sub campus. As a capacity building, recruited 135 scientists / teachers and 185 supporting staff with proper induction programme. I have introduced the sanction of increments / promotions based on annual assessment of staff by concerned higher controlling authority on cumulative score card system. Internal receipt of university from all the sources was increased to Rs. 9.60 crores from meagre Rs. 1.17 crore in just four years. All this resulted in receiving many awards / recognitions for staff and students at National level. UAS, Raichur became more popular and farmer-friendly making it a real "Farm University". I have served as a member of the selection committee in the selection of scientists in different Agricultural Universities / ASRB, New Delhi. I have served in the editorial board as advisor / councillor member for different National and International journals. I have served as Academic council and Board of studies member in different Agricultural Universities. I have also served as Member of ICAR society and ICAR Governing Council, New Delhi, as QRT member for NCIPM, New Delhi and Chairman of RAC for CICR, Nagpur. Currently, I am serving as Academic council expert member of PJTSAU, Hyderabad and member of the Board of Management RLBCAU, Jhansi and Chairman of RAC of NBAIR, Bangalore.

AP: *You are also serving as member of advisory committee to various organizations and agricultural universities. What are your emphases in providing quality entomological research?*

BVP: I served as QRT member for PDBC, Bangalore, NCIPM, New Delhi. My major emphases were to undertake research in the farmers' field for validation of results. I also served as chairman, research advisory council, CICR, Nagpur for 3 years. Our recommendation was to develop short duration compact cotton variety genotype suitable for high density planting and compatible for machine picking. I was member of the Governing council of Jansi Rani Laxmi Bhai Central Agricultural University, Jhansi for 5 years and sug-

gested to start many Agricultural Diploma courses to meet the current demand in the agricultural sector in addition to UG and PG courses. I am also nominated expert in the academic council of PJTSAU, Hyderabad for 6 years. I was involved in course formulation, infrastructure development, formulation of academic guidelines and admission set up. I was also nominated as expert in the selection of teachers and scientists by Governor of Telangana State. I was the vice president of Entomological society of India, New Delhi along with Dr. N.K. Krishna Kumar, DDG (Hort.), IACR, New Delhi under the leadership of our president Dr. S.N. Puri, Former Vice-chancellor CAU, Imphal. I was specially involved in formulating guidelines for different awards like, fellow of Entomological society of India, life time achievement awards in the field of Entomology etc. Presently I am serving as chairman RAC, NBAIR, Bangalore and revised research programme of the institute for next 3 years. I have advised to give emphasis on both basic and applied aspects of Entomology research particularly on molecular taxonomy, molecular diagnosis of insecticide resistance, insect behavioural response studies, and ecological engineering studies. Suggested the institute to develop as a 'Taxonomic Hub' for the country.

AP: *Though IPM is the best option for eco-friendly management of pests, there is a great challenge in adoption of it and how to overcome it?*

BVP: Everyone rightly accepts IPM as the best solution for our farmers for effectively managing the pest population in different crops ecosystem. But there are few important challenges that our farmers are facing while implementing IPM. Firstly, in my opinion our farmer's knowledge is a major limitation due of their poor educational background which makes them difficult to understand the concepts of IPM components. Secondly, small holdings of the farmer and their economic constraints prevent them in implementing IPM. Thirdly, availability of IPM components particularly bioagents on credit basis is limited due to the poor economic status of our farmers. In addition to these there are few more which however can be overcome

by the farmers with little efforts. But the major challenges need to be overcome by the Government with the help of State Agriculture Departments and Agricultural Universities by educating farmers through field visits/ demonstrations/trainings. Facilitating



Dr.AP in conversation with Dr. BVP

availability of IPM components on subsidy basis along with subsidizing Greener / Safer pesticides and more importantly continuous monitoring of pest population and recommendation of suitable IPM strategy is need of the hour. This should help the farmers to get higher yields with higher net profit, then only farmers accept the IPM strategy.

AP: Other than IPM what are the other areas of entomology you have worked?

BVP: As I said earlier in addition to IPM, I have worked on insect ecological studies in paddy and groundnut, insecticide resistance in *Helicoverpa* populations collected from different cotton ecosystems of south India.

AP: Finally what valuable suggestions you would like to give for the younger generation seeking specialization in agricultural entomology?

BVP: The interest in entomology should come from M.Sc. (Agri.) level wherein student should focus on learning basics of entomological research right from the experimental layout to biological studies, sampling of insect's population, estimation of pest incidence and yield loss with good interpretation of data statistically. During Ph.D. programme one should

have in-depth information on the problems that he/she wants to work, review the latest information, finalize the methodology for various studies and come out with at least one new information which should be of first record from their research with good publications in high impact journal. In my opinion young Entomologists should develop their own interest in a particular field of entomology and get trained in that area under expert entomologists and expose themselves in attending entomology related Seminars/ Conferences and involve in discussion with experts. Another important area is effective implementation of a research programme with *out of box* thinking. Writing a project with at most care with reference to for-



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