

WOMEN IN ENTOMOLOGY

Interview with Dr. M. Shanthi, Director of Centre for Plant Protection Studies, Tamil Nadu Agricultural University, Coimbatore

Dr. M. Shanthi is a distinguished Agricultural Entomologist and academic leader and at present, the Director of the Centre for Plant Protection Studies (CPPS) at Tamil Nadu Agricultural University (TNAU), Coimbatore. With over three decades of experience in teaching, research, extension, and administration, she has made significant contributions to insect ecology, eco-friendly pest management, and plant protection technologies. Trained in TNAU and mentored by some eminent Indian Entomologists, Dr. Shanthi has guided numerous postgraduate and doctoral students and has been instrumental in developing innovative botanical and bio-based pest management formulations targeting major crop pests such as *Spodoptera frugiperda* and *Plutella xylostella*. Her career reflects a strong commitment to integrating scientific research with practical solutions for farmers. As the first woman Director of CPPS from the discipline of Agricultural Entomology, she exemplifies the growing leadership of women scientists in crop protection and continues to inspire the next generation of entomologists through her contributions to research, education, and institutional development.



Dr. M. Shanthi
Director, Centre for Plant Protection
Studies, Tamil Nadu Agricultural
University, Coimbatore

Tamil Nadu Agricultural University (TNAU) is a pioneering institution in agricultural education, research, and extension in India, consistently contributing to the advancement of sustainable agriculture. Unique among state agricultural universities, TNAU has established a Centre for Plant Protection Studies, dedicated to addressing crop protection challenges through research, innovation, and training. The university has also been a centre for nurturing expertise in integrated pest management and has also established a state-of-art museum exclusively for insects in the country for the first time. Dr. M. Shanthi, an

eminent agricultural entomologist from TNAU, has the distinction of being the first Directress from Agricultural Entomology, exemplifying the university's commitment to leadership, scientific excellence and the development of skilled professionals in plant protection.

Dr. Chitra Narayanasamy (CN): When was the Centre for Plant Protection Studies started in TNAU?

Dr. M. Shanthi (MS): The Centre for Plant Protection Studies (CPPS) was established in April, 1984 in TNAU to coordinate and strengthen



CABI PlantwisePlus National Stakeholders Meeting

teaching, research and extension activities in Plant Protection and Sericulture. Agricultural Entomology, Plant Pathology, Plant Nematology and Sericulture are the constituent departments of this Directorate.

CN: What is the advantage of having a Centre for Plant Protection Studies instead of individual directorates of separately for entomology, pathology, nematology and sericulture?

MS: The consolidation of entomology, plant pathology, nematology and sericulture within a unified Directorate of the Centre for Plant Protection Studies (CPPS) at TNAU establishes a comprehensive, multidisciplinary platform for plant health management. This integrated organizational model offers clear advantages in coordination and efficiency and can therefore be recommended as a best-practice framework for other universities.

CN: Since you have indicated that this structure can serve as a model for others, could you please elaborate on how such an integrated system contributes to effective plant protection?

MS: The integrated structure of the Centre for Plant Protection Studies enables close collaboration among allied disciplines and creates a comprehensive framework for addressing complex crop protection challenges more effectively. This multidisciplinary approach strengthens teaching, research, and extension by bringing together expertise across the major components of plant health management.

Scientific and academic integration

- The four disciplines together cover the full spectrum of biotic stresses: insects, pathogens, nematodes and insect-based cropping systems (mulberry–silkworm), enabling truly holistic teaching and research in plant protection.

- This structure facilitates interdisciplinary course design and joint guidance of PG/ PhD students, allowing problems like vector-borne diseases or disease–nematode complexes to be handled in a single academic ecosystem.

Integrated research and IPM development

- Many field problems require combined expertise, for example, insect-vectored plant diseases or soil-borne complexes involving fungi and nematodes; a single directorate makes it easier to design integrated experiments and solutions.
- CPPS already coordinates state-wide pest and disease surveillance and IPM-linked biocontrol development (e.g. *Trichoderma*, *Pseudomonas*, *Beauveria*), demonstrating how co-location of disciplines accelerates

technology development and refinement.

Stronger extension and surveillance impact

- With all plant protection disciplines under one roof, TNAU can offer “one-stop” plant health clinics, unified advisories, and joint farmer trainings, rather than fragmented messages from separate departments.
- The integrated directorate has enabled state-wide pest and disease surveillance programmes and coordinated awareness campaigns (including nematode awareness and IPM trainings), which are harder to manage when units are administratively separate.

Efficient use of infrastructure and human resources

- Shared diagnostic labs, culture collections, insectaries, nematode facilities and



Recent field problem: Coconut Rugose Spiralling Whitefly awareness campaign



Recent field problem: Sugarcane Crown mealybug and Pokkah boeng disease

sericulture units reduce duplication of infrastructure and allow specialized equipment to be optimally used across disciplines.

- Centralized leadership under one Director improves planning, budgeting and prioritization of plant protection research, ensuring resources flow to cross-cutting problems of state and national importance.

Uniqueness of CPPS in TNAU

- CPPS in TNAU is explicitly constituted as a multi-department plant protection directorate (entomology, pathology, nematology, sericulture), which is not commonly seen as a single integrated directorate in other SAUs or general universities, where these subjects are often scattered across separate faculties or

departments.

- Given global calls for multidisciplinary crop protection and integrated pest and disease management, this TNAU model can be logically recommended for other centres/universities, especially where fragmented plant protection units hinder coordinated research, teaching and extension; adopting a similar directorate would strengthen IPM, surveillance, and farmer advisory systems.

CN: What are the recent field based problems that has been the primary focus in the directorate?

MS: The recent field problems addressed include coconut wilt, Rugose whitefly in coconut, sugarcane mealybug, Pokkah boeng disease of sugarcane and tapioca mealy bug. Prime research

is undertaken on the above in addition to the regular mandates of directorates. *Anagyrus lopezi* a parasitoid was released against the invasive mealy bug *Phenacoccus manihoti* in collaboration with National Bureau of Agricultural Insect Resources, Bengaluru.

CN: Could you elaborate the key development initiatives undertaken under your leadership as Director like new collaborative programmes with national and international agencies?

MS: To strengthen research, student training, technology transfer and international linkages, several Memoranda of Understanding (MoUs) were facilitated with global and national agencies. At the international level, collaborative agreements were established with the World Vegetable Centre, Taiwan (for 3 years) to develop innovative IPDM strategies in tomato and lablab bean, Observatoire Regional de Lutte Anti-Termites (ORLAT) – CIRBAT, France (for 3 years) for termite management

strategies, and the Minor Use Foundation, USA (for 3 years) for generating MRL data for insecticides in minor-use export crops.

At the national level, a five-year MoU was signed with the ICAR–National Bureau of Agricultural Insect Resources (NBAIR), Bengaluru to support Ph.D. student research programmes. In addition, collaborations with private and development organizations were established to strengthen interdisciplinary research, student training, AI-based agricultural solutions and farmer empowerment. These include MoUs with NEC Corporation India Pvt. Ltd. for AI research; SMJ Smart Products Pvt. Ltd. and Zensit Smart Products Pvt. Ltd., Madurai for web-based applications; Indian Oil Corporation Ltd., Chennai for CSR-funded research and extension; and farmer-producer organizations such as Siruvani Uzhavar Producer Company Ltd. and Perur Jai Hind Vegetable Farmers Producer Company Ltd. for technology dissemination and farmer empowerment. Industry partnerships were forged



International Conference on One Health Perspectives in Global Plant Protection Research (19th to 21st February 2025)



International Day of Plant Health (12th May 2024)

with Syngenta India Pvt. Ltd. for product testing; Sri Sivasubramaniya Nadar College of Engineering, Chennai and KIT Kalaingarunanidhi Institute of Technology, Coimbatore for AI-based research; Angalamman Hi-Tech Agro Industry, Trichy for M.Sc. student research; and SMBRK Environment Solutions Pvt. Ltd., Dharapuram for converting solid waste into value-added products using black soldier flies. A recent agreement with Indofil Pvt. Ltd., Maharashtra supports fellowship programmes for students. These strategic collaborations collectively promote multidisciplinary research, innovation, student capacity building, technology validation and industry-academia integration in plant protection and allied disciplines.

CN: What are the outreach activities, like trainings and seminars that were conducted under your leadership?

MS: We successfully organized the International Conference on One Health Perspectives in Global Plant Protection Research (OHPGPR 2025), which

brought together more than 500 scientists, researchers and academicians from India and abroad. A total of 466 participants registered under nine scientific themes, featuring six keynote speeches, 30 lead papers, 145 oral presentations and 288 brief oral contributions, covering multidisciplinary areas of global significance in plant health. This international meet facilitated knowledge exchange, strengthened global collaborations, and promoted integrated approaches aligned with sustainable crop protection and food security goals.

To commemorate the International Day of Plant Health on 12 May 2024, an international webinar titled “Promoting Awareness on Plant Health, Safe Trade and Digital Technologies” was organized in hybrid mode. The Vice Chancellor awarded prizes to students who excelled in national-level competitions on themes related to biodiversity protection, healthy plants and environmental sustainability. Approximately 450 postgraduate students, researchers and scientists

from TNAU constituent colleges, affiliated institutions, Krishi Vigyan Kendras, research stations and universities such as SRM, CUT, Karunya and CICR benefited through this programme. The webinar emphasized the importance of phytosanitary measures, digital surveillance tools, regulatory frameworks and safe trade practices.

A comprehensive pesticide orientation programme was organised on 21–22 March 2024 to sensitize final-year B.Sc. (Hons.) Agriculture and Horticulture students before their Rural Agricultural Work Experience (RAWEX) programme. Postgraduate and doctoral scholars specializing in Agricultural Entomology, Plant Pathology and Nematology were also oriented on safe handling of pesticides, label claims, toxicity classifications, residue management and resistance prevention strategies. Executives from major agro-chemical

industries such as Coromandel, Syngenta, Rallis, FMC, Corteva, PCI, Bannariamman Sugars Ltd., Aerotics, and De Pest showcased novel technologies, shared product stewardship information and interacted with students. The programme enhanced practical knowledge, improved awareness on regulatory norms, and highlighted emerging trends in precision pest management.

World Bee Day was celebrated on 20 May 2024 at the Department of Agricultural Entomology, CPPS, TNAU, for widespread awareness on bee conservation, pollination services and youth engagement. Following the global theme “Bees Engaged with Youth”, nearly 100 students participated in competitions on bee crafts, honey collection, pollination games and nest building. Students were exposed to



Visit to ARK Tomato facility cultivation, Changhua, Taiwan

the apiary unit to learn about bee species, colony structure, safe handling, and modern scientific beekeeping practices. In addition, activities under the National Bee Board sponsored Advanced Multi-Centre Programme (AMCP) worth ₹99.10 lakhs were implemented across 4 colleges, 15 KVKs and research stations through seminars, district training programmes and on-site demonstrations. The initiative expanded scientific beekeeping literacy, strengthened extension support for bee-based livelihoods, and promoted pollinator-friendly agricultural practices across Tamil Nadu.

An International Conference on Unleashing the Power of Seed and Crop Health Innovations for a Food-Secure World (ICUCF 2024) was jointly organized by CPPS and the Seed Centre, TNAU, on 21–22 November 2024. The event brought together 415 participants from national and international institutions, representing scientists, policy-makers, entrepreneurs, educators and students. Scientific activities included 16 lead lectures, 218 poster and oral presentations across 10 specialized technical sessions encompassing Plant Pathology, Entomology, Nematology and Sericulture. The conference highlighted advancements in seed technology, diagnostics, bio-intensive pest management, disease resistance breeding, and phytosanitary regulations. By promoting collaboration between research bodies and seed industries, the conference emphasized the linkage between crop health innovations, food security and sustainable agricultural development. It provided a significant platform for integrating seed quality, disease-free planting material, and resilient germplasm strategies into future farming systems.

CN: Could you explain the strategies or guidance you provided to help faculty achieve their objectives in the field?

MS: I have consistently motivated and guided the plant protection scientists to achieve their goals by encouraging them to develop and deliver practical technologies to the farming community. As a result of this continuous support and gentle nudging, several plant protection technologies from entomology (including apiculture), plant pathology and nematology were successfully developed and patented.

For the first time registered CPPS, TNAU in CIB&RC for registration of biopesticides developed at Pathology, Nematology and Entomology. The following formulations are under pipeline for registration in CIB&RC by CPPS.

- *Pochonia chlamidospora*,
- *Trichoderma viride*,
- *Bacillus subtilis*,
- *Metarhizium anisopliae*

To recognise and celebrate these achievements, I initiated the establishment of a “**Wall of Honour**” in the Directorate, where all patents obtained by the scientists are prominently displayed. This not only acknowledges their contributions but also inspires a culture of innovation and excellence within the Directorate.

CN: Could you outline the major hurdles you encountered during your tenure as Director?

MS: I would not describe them as “hurdles.” Instead, I have always viewed such situations as opportunities to strengthen the Directorate and move forward with greater clarity and purpose. Every challenge—whether related to coordination among disciplines, resource limitations, or meeting the expectations of stakeholders—served as a chance to innovate, refine our strategies and enhance our collective performance.

CN: What are the future lines of research that are likely to dominate plant protection?

MS: The future of plant protection research is being shaped by evolving challenges like climate change, pesticide resistance, emerging pests and diseases, and the demand for sustainable agriculture. Based on current trends, the major lines of research likely to dominate plant protection include: Climate – Smart and adaptive plant protection: Studying how climate change affects pest and disease dynamics, developing forecasting models for emerging pests and diseases, digital tools, AI driven pest/disease monitoring and decisions support systems could be crucial in plant protection in the near future, in addition to our other mandatory programmes as host plant resistance, biological control and other methods of pest management.

CN: What motivated you to specialise in Entomology? Could you share your journey to becoming the Director of CPPS in TNAU and your significant achievements?

MS: When I joined the B.Sc. Agriculture program at the Agricultural College and Research Institute (TNAU), Madurai, I observed that entomology-related field problems played a critical role in achieving higher crop yields. I was profoundly inspired by Professor Dr. K. Gunathilagaraj, whose teaching further fuelled my interest in entomology.

I was the recipient of ICAR Post Matric Scholarship for B.Sc. Ag (1985-1989) and ICAR Junior fellowship for M.Sc. Ag). I pursued my post graduate research on management of storage pests in paddy and pulses under the eminent guidance of Dr.G.Logeeswaran, Professor of Entomology (Retd.) in TNAU. Served in TNAU as Senior Research Fellow in January 1992, worked in DBT schemes on Biological control under Dr. S. Jayaraj, Former Vice

Chancellor and Dr. R.J.Rabindra, Former Director, NBAIR, Bengaluru till 1995. Joined as a faculty in 1995 in TNAU and later pursued my Ph.D. research programme “Insect plant interactions study on okra shoot and fruit borer” under the chairmanship of Dr. S. Uthamasamy, Former Director of Extension Education, TNAU, Coimbatore.

I have been an undergraduate teacher for 24 years and for 15 years also taught post graduate students. Have handled 66 courses as course teacher and 48 courses as course associate. I have guided 12 postgraduate students and 11 Ph.D. students. Developed eco-friendly and innovative formulations including Mahogany Methanolic Extract (MME 30 EC), *Sesbania grandiflora* 40 SL, synthesized N-Alkyl Chitosan and Chitosan O-Arginine targeted against the Fall Armyworm *Spodoptera frugiperda* and Diamondback moth *Plutella xylostella* through student thesis research. Further, I initiated research on efficacy of proteinase inhibitor and synthesis of chitosan derivatives and their effect on insect pests, viz., *P. xylostella* and *S. frugiperda*. I worked in AICRP Tropical fruits scheme for 2 years at Periyakulam and AICRP Cotton for 2 years at Srivilliputtur and was in administration for 9 years and have associated extension service for the past 31 years. I have operated 29 externally funded schemes with budget outlay Rs. 11.12 crores from national and international funding agencies. I have also operated 24 bioefficacy schemes, collaborated in the release of six crop varieties and have four patent copyrights related plant protection tools/ technology. I have developed 37 technology transfer modules. I have undergone a training and attended 4 conferences abroad and 48 conferences within the country. I am also serving as the principal member Bureau of Indian Standards - FAD 34: P4 - Plant Health Management Panel, representative in the IBSC of

TNAU –DBT, part of the team of Board of Directors in Centre of Excellence in Biotechnology (CPMB, TNAU), State-level committee member to monitor Pesticide residues under the MPRNL Scheme and the Board of Studies member for Postgraduate Education, Agriculture, Horticulture, Agricultural Engineering and Community Science in the University. I have published around 160 research papers and have authored 18 book chapters. I also was awarded the best teacher award during 2011 in TNAU.

The above conversation was conducted by Dr. Chitra Narayanasamy, Professor of Agricultural Entomology and Curator of the TNAU Insect Museum at the Department of Agricultural Entomology, Tamil Nadu Agricultural University, Coimbatore. With over 15 years of experience in teaching and

research, she specializes in insect taxonomy and biodiversity. Dr. Chitra has played a significant role in the establishment and development of the TNAU Insect Museum and has led funded research projects in insect taxonomy supported by the Department of Science and Technology, Government of India. She also serves as a member of the editorial boards of two scientific journals, contributing actively to the advancement and dissemination of entomological research.

Dr. Chitra Narayanasamy
Professor (Agricultural Entomology)
& Curator (TNAU Insect Museum)
Dept. of Agricultural Entomology
TNAU, Coimbatore 641003, Tamil Nadu, India