VEGETABLE PROTECTION DIVISION

Institute Projects

6.1. Integrated insect pest management of major vegetables for safer vegetable production This project develops eco-friendly pest management strategies integrating biological control agents, botanicals, pheromone traps, and selective insecticides for major vegetable pests. Research identifies effective newer molecules with favourable toxicological profiles and establishes economic threshold levels. Farmers benefit from reduced pesticide usage and safer produce while consumers gain access to residue-free vegetables.

6.2. Characterization and integrated management of plant pathogens (diseases) of vegetable crops The project focuses on molecular characterization of fungal, bacterial, and oomycete pathogens affecting vegetables and develops integrated disease management strategies. Research establishes pathogen variability, identifies resistance sources, and validates biocontrol-based management modules. The outcomes enable targeted disease management, reduce fungicide dependency, and support production of healthy planting material.

6.3. Diagnostics of viruses infecting vegetable crops and its management through novel strategies This project develops diagnostic protocols for emerging viral diseases and devises management strategies including resistant varieties, vector management, and certified seed production. Research addresses ToLCV, ChiLCV, and cucurbit viruses causing significant yield losses. Early and accurate diagnosis enables timely interventions while resistant varieties provide sustainable disease management options for farmers.

6.4. Bio-intensive management of root-knot nematode in vegetable crops The project identifies resistant germplasm, develops biocontrol-based management strategies using *Trichoderma*, rhizobacteria, and entomopathogenic fungi against root-knot nematodes in vegetables. Research establishes effective application protocols and soil health indicators. Farmers benefit from reduced nematicide usage and improved soil health while the bio-intensive approach supports organic and natural farming systems.

6.5. Residue analysis and risk assessment of pesticides in vegetable crops This project establishes pesticide dissipation kinetics, determines pre-harvest intervals, and develops household decontamination methods for ensuring vegetable food safety. Research validates multi-residue analytical methods and conducts market surveillance for pesticide contamination. The outcomes support MRL compliance for domestic and export markets, guide farmers on safe pesticide usage, and protect consumer health.

6.6. Integration of compatible components to develop crop-specific module for IPDM in vegetables The project integrates resistant varieties, biocontrol agents, cultural practices, and need-based chemical interventions into comprehensive IPDM modules for major vegetable crops. Research validates module efficacy while conserving natural enemies and pollinator safety. Farmers gain access to ready-to-adopt management packages ensuring economic pest control with minimal environmental impact.