NEPAL

Principal Investigator: Dr. Ram Khadka

Internship Title: Molecular Plant Pathology and Molecular Biology Internship

Time Period: May 2024

Project Background Vegetable production can provide income for farm families and downstream benefits to rural communities in Nepal. However, root-knot nematodes, soilborne fungal, oomycete, and bacterial pathogens, and weeds reduce their yield, quality, palatability, storability, and nutritional value. We are evaluating anaerobic soil disinfestation (ASD) in combination with native Nepal biocontrol Trichoderma spp. and Bacillus spp. and grafting technology to test their capacity to suppress soilborne pathogens and weeds in tomato and pepper production systems. We are testing these techniques using a gender-balanced participatory action research (PAR) approach with mother-baby trials. We are looking for research interns through The Trellis Fund Fellowship Program to support our local researchers and Research Interns in developing next-generation sequencing and bioinformatic pipelines in microbial community analysis, gene expression and plant virus and viroid diversity analysis. We have well set-up laboratory for both conventional and real-time PCR. We are using Oxford nanopore for sequencing. The intern students will get opportunities to interact with participating farmers across the country, our research interns and local researchers to understand the local settings, understand the challenges of local producers and how the project is dealing with tackling those challenges faced by vegetable growers in Nepal.

Research Question(s) or Specific Issues to be Addressed	**Range of Acceptable Disciplines**	**Deliverables**
Effect of anaerobic soil disinfestation on the fungal and bacterial community in soil Effect of rootstocks on gene expression pattern in pepper and tomato Identification of viruses and viroid infecting tomato and pepper plants in Nepal by metatranscriptomics	Plant Pathology or, Horticulture with a strong background in molecular biology or bioinformatics to support our local researchers and interns in developing a pipeline for handling next-generation sequencing data generated in Oxford Nanopore for microbiome, gene expression and plant virus diversity analysis.	Develop pipeline and protocol for plant virus detection using Oxford nanopore. Develop pipeline and analyze gene expression in tomato plants grafted in different rootstocks. Develop pipeline and analyze microbial community in soil collected from different carbon source amended ASD treated soils.