Objective:

1. Identification of weed / alternate hosts and peach cultivars susceptible to peach decline phytoplasma.
2. Identification of insect – vectors and their hosts carrying / perpetuating peach decline phytoplasma.
3. Detection of peach decline phytoplasma occurring at different stages of growth of peach cultivars.
4. To identify at least 100 samples.

Summary

Two annual weed species viz., *Erigeron annuus* and *Dryopteris* sp. and two tree species viz., *Prunus domestica* and *Toona ciliata* growing in and around an infected orchard with symptoms of virus / phytoplasma like diseases were found to carry peach phytoplasma infection as evident from PCR detection by employing peach phytoplasma specific probes. Therefore, these species have been identified as alternate / reservoir hosts for peach decline phytoplasma. All the commercially grown cultivars of peach namely, July Elberta, Red Haven, Sun Haven and Giant Elberta were found to be susceptible to phytoplasma as they exhibited typical symptoms of phytoplasma infection. Additionally, thirty four germplasm collections of peach and nectarine were artificially inoculated with peach decline phytoplasma and all were found to be susceptible to the disease. Leafhopper species *Atkinsoniella opponens* (Walker) (Tribe: Cicadellini, Subfamily: Cicadellinae) and *Evacanthus repexus* (Distant) (Tribe: Evacanthini, Subfamily: Cicadellinae) were found to contain phytoplasma as evident from positive detection of phytoplasma in them through nested PCR by employing universal primers at Solan Centre and specific probe at Lucknow Centre. It is interesting to mention here that these species were found to be prevalent in the orchard throughout the active growing season and were also observed feeding on weeds (*Erigeron annuus* and *Dryopteris* sp.) which carried phytoplasma. Both leafhopper species were present on almost all the plant species existing in the orchard floor, thus found to be polyphagous in nature. Some eggs of leafhopper were observed on under surface oak leaves. Exubae of these species were also present on oak leaves as well as *Erigeron annuus* leaves indicating that these leafhoppers might be perpetuating in the oak trees during the dormant season and on *Erigeron annuus* in growing season. Samples were collected from infected peach plants at different growth stages and phytoplasma was detected in roots during the dormant season i.e from November to February and in all plant parts at blossom stage (March). At fruiting stage, the phytoplasma was detectable from twig bark and leaf mid veins and was not always detected from roots.