

Third Laureate Applied Research

Scientific Committee: Agriculture & Natural Resources

Research Work Title

Acquisition of Technical Knowledge and Production of Tolerant and Resistant Cultivars of Limes to Causal Agents of Witches' Broom Disease



Executive Organization

Agricultural Research Education and Extension Organization, Horticultural Science and Research Institute, Citrus and Subtropical Fruit Research Centre

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Abstract

Lime (*Citrus aurantifolia*) is one of the most economical horticultural crops in the south of Iran. The spread of the witches' broom disease in the lime orchards in the southern regions of the country caused a drastic reduction in the yield of the infected trees and led to the destruction of a large number of citrus trees which eventually contributed towards tree drying. The causal agent of the Witches' Broom Disease of Lime (WBDL) is a bacterium limited to the phloem vessel called *Candidatus Phytoplasma aurantifolia* transmitted by *Hishimonus phycitis*, a member of the Cicadellidae family. To obtain tolerant or resistant varieties, new genotypes were collected from the infected areas. Since the lime grew from seeds more than several decades ago, more than 100 pseudo-limes were collected from different citrus producing provinces and were kept under controlled and appropriate conditions. Morphological characteristics, genetic diversity and quantitative and qualitative fruit results were assessed for the introduction of new cultivars. The higher genotypes were assessed for their tolerance or susceptibility to the WBDL agent by inoculation. The results of this study led to the introduction of two disease-tolerant limes cultivars named Pars and Persia and a new tolerant hybrid cultivar called Parnian as well as a resistant grapefruit cultivar named Mana. In addition to introducing four cultivars, the lime gene bank was created under controlled conditions with over 100 limes and pseudo limes. Introduction of the new cultivars was made during the five phases of collection, production and evaluation of horticultural traits of hybrids by limes, evaluation of fruit quantitative, qualitative and genetic characteristics of the selected lime genotypes and evaluation of tolerance and resistance to the phytoplasma of the WBDL agent. Finally, the new cultivars and their maintenance were introduced by the lime gene bank for the first time in the country. Along with these cultivars, two new lime cultivars will be introduced.



Pars



Persia



Lime Gene Bank



Mana