Yellow Vein Clearing of Lemons in Turkey

N. Önelge, O. Bozan, M. Gök, and S. Satar

Çukurova University, Agriculture Faculty, Plant Protection Department, 01330, Adana, Turkey

ABSTRACT. Lemon production is an ancient and important sector of Turkish agriculture. In 2005, there were 6.6 million lemon trees in Turkey and 18.78% of them were in the Çukurova region. Interdonata and Kütdiken lemon varieties on sour orange rootstock in field were observed yellow vein clearing (YVC) symptoms in Çukurova region in 2000. Yellow vein clearing symptoms appear with yellow flecks at varying length on lateral veins. This symptom is combined with leaf crinkling and warping of young leaves. Field symptoms are very clear during spring and autumn flushes, and the symptoms remain visible on mature leaves. Graft transmission studies showed that YVC was transmissible to sour orange, Interdonata, Kütdiken, Italian and Lamas lemon varieties. However, several sweet oranges (Madam Vinous, Pineapple, Navelina, Washington navel, Valencia), mandarins (satsuma, Clementine, Fremont, Nova, Parsons’s Special, Kara), grapefruits (Star Ruby, Rio Red, Marsh seedless, Duncan), Tahiti lime and rough lemon did not develop any YVC symptoms.

Fig. 1. Different leaf symptoms of YVC on Kutdiken lemon: A - yellow vein clearing, B - chlorotic lesions, C - yellow vein clearing with leaf deformation.
Graft transmissible studies showed that YVC was transmissible to sour orange, and Interdonato, Kutdiken, Italian and Lamas lemon varieties (Fig. 2). However, Madam Vinous, Pineapple, Navelina, Washington navel, Valencia oranges, satsuma, Clementine, Fremont, Nova, Parson's Special, Kara mandarin varieties, Star Ruby, Rio Red, Marsh Seedless, Duncan grapefruits, Tahiti lime and rough lemon did not shown any YVC symptoms. The YVC was compared with *Citrus psorosis virus* (CPsV), *Citrus variegation virus* (CVV) and *Citrus Chlorotic Dwarf Disease* (CCD). CPsV induced symptoms on sour orange, lemon, mandarin, orange and grapefruit varieties, but YVC symptoms only appear on sour orange and lemon varieties. The DAS-ELISA results for CVV on YVC infected lemon and sour orange varieties were negative. The symptoms of YVC are very similar to CCDV, which is transmitted by whitefly, *Parahemisia myricae* (Kuwana) (5). However, CCDV-infected mandarin, orange and grapefruit seedlings showed symptoms on leaves, but YVC did not. YVC was transmitted mechanically by slash inoculation from citrus to citrus. The disease may be insect transmitted, but further investigations are necessary to confirm this.

**LITERATURE CITED**