

Impietratura in Mediterranean Countries

IN 1955 Ruggieri (1) reported the presence in Sicily of a new disease of unknown nature, affecting various orange varieties and Marsh grapefruit. In September, 1959, at the Conference on Citrus Virus Diseases in the Mediterranean Area, held at Acireale (Sicily), he pointed out that the disease had spread over almost all the orange varieties, and he concluded the probable presence of a virus.

After Ruggieri's visit to Morocco in November, 1959, a survey was made in 4 countries of the Mediterranean area. This note deals with the results of this survey.

Morocco

Oranges collected in 1934 near the Plant Protection Laboratory in Casablanca and preserved in fixing solution, show the typical symptom of the disease—presence of gum pockets in the albedo. The name “gum pockets” was given to the trouble at that time.

For the past two years in the Casablanca area, Washington Navel orange trees have produced fruits with symptoms of impietratura. Besides the symptoms described by Ruggieri, a premature and abnormal drop of fruits occurs during August-September; Ruggieri considers this drop to be associated with impietratura. Although it is not known whether the disease has been present in this grove more than 2 years, damages have continued to increase. Furthermore, on the fruit market in Rabat, fruits with typical gum pockets have been found among the Washington Navels.

Lebanon

In February 1960, while looking at stubborn-affected trees in a grove in the Saida district, we noticed fruits with impietratura gum pockets. A more careful survey of the same grove revealed a great many trees affected by the disease. It has not been possible to detect foliar, or other, symptoms, since the trees also had stubborn, the symptoms of which may mask those of impietratura. The orange trees were of several varieties, among which were Baladi and Shamouti.

After the above-mentioned survey, during a visit to an important packing house that handles fruits from various groves in the Saida district, we observed large numbers of impietratura-affected oranges moving on the travelling bands. Almost all these fruits were Shamouti oranges. There were practically no acorn fruits.

Turkey

A few cases of impietratura had been noticed by Adil Cengiz, of the Plant Protection Service, Adana. Subsequently, a survey of all the citrus-growing areas of Turkey, done together with Erdogan Altan, head of the Citrus Experiment Station of Antalya, and with Adil Cengiz, revealed cases of impietratura in almost all the visited areas, with a greater predominance along the south coast, especially around Dörtyol, Adana, and Finike.

The area around Finike is isolated from all the other citrus-growing areas of Turkey because of the Taurus Mountains. Furthermore, it has specialized in local varieties of oranges, whose names are not always well known. Fruits of some of these varieties are absolutely remarkable with respect to size, juice content, and seedlessness.

In a grove containing 70 per cent local orange varieties and 30 per cent Washington Navels, a great number of severe cases of impietratura were found, but only on the local varieties.

Affected trees could be distinguished in February from far away by the fallen fruits. Furthermore, by comparing these trees with their apparently healthy neighbours, a very different type of foliage could be noticed on the impietratura-affected trees. The tree seemed to suffer, the growth was less vigorous, and the leaves were slightly wilted. The major part of the fruits from these trees had gum pockets in the albedo and under the calyx. Besides, a great many fruits were smaller; some were

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extremely hard (like a stone), although they were almost ripe. Finally, a very typical modification of the shape of the fruit could be seen; whereas the fruits of the variety Finike Yerli are normally round, the fruits from the impietratura-affected trees were definitely pear-shaped (Fig. 1). Only the trees with fallen fruits and an unhealthy foliage bore fruits with gum pockets and the other symptoms. The trees without fallen fruits and with healthy foliage had only healthy fruits.

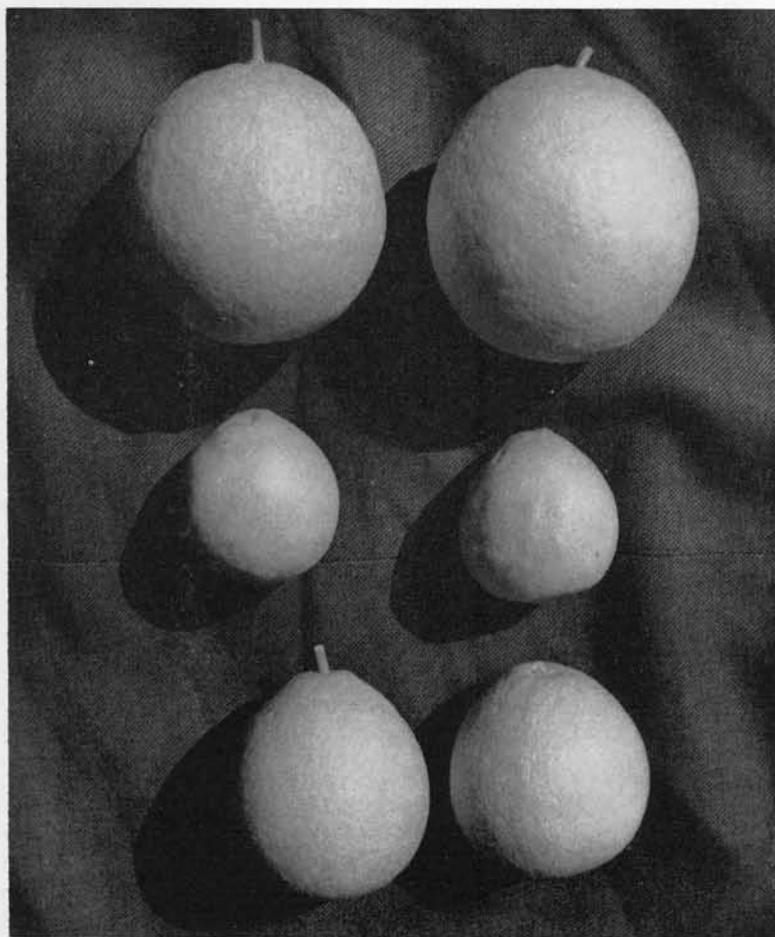


FIGURE 1. *Impietratura* disease on Finike Yerli orange (Finike, Turkey). Upper row: round, healthy fruits. Middle row: pear-shaped affected fruits, with gum-pockets in albedo. Lower row: pear-shaped, stone-hard affected fruits.

Conversely, one could find fruits with gum pockets and the shape of a pear only on trees showing a premature drop and a deficient foliage. Never have such fruits been observed on trees with a normal external appearance.

These facts confirmed how constantly the following symptoms were associated: poor growth, premature drop of the fruits, gum pockets in the albedo, and pear-shaped fruits.

Some other groves in the same district also had symptoms of Impietratura on oranges, but with a lesser degree of severity. According to the citrus growers, this disease has existed for several years. It was first noticed because of the premature drop of many fruits and gum pockets in the albedo.

Greece

Too short a stay in Greece did not allow us to form our own ideas of the status of the disease there. Nevertheless, examination of the small citrus collection of the College of Agriculture of Athens was enough to establish the presence of impietratura on two Sultani orange trees (variety native of Crete) and the less certain presence on a Tangelo, presumably Sampson.

According to Dr. C. Catsimbas, Plant Pathology Laboratory, Athens, impietratura may be widespread wherever citrus is grown in the great many islands that form Greece. Dr. Jean A. Sarejanni, professor of Plant Pathology, College of Agriculture, Athens, believes that this disease is rather old in Greece. He remembers having sent, many years ago, some samples to Dr. H. S. Fawcett, who answered that he himself was not acquainted with the disease but that he knew it was present in South Africa. It may be that one deals here with the same cases as those reported by Morris in Rhodesia, according to Ruggieri (1).

Conclusions

Beside Italy (Sicily), where the disease was described for the first time, all the Mediterranean countries surveyed are affected to various extents with the impietratura disease. This is an alarming fact. Moreover, the widespread occurrence of the disease in Turkey, especially on purely local varieties, leads one to think that impietratura might become a serious problem for certain countries of the Mediterranean area and that from now on all the citrus-growing countries should add the problem of impie-

tratura to their program on citrus diseases. It is too bad that this problem has been overlooked by international organizations such as E.P.P.O. and F.A.O.

In the countries that we visited, the economical importance of the disease can immediately be evaluated by the losses in fruits before harvest (premature drop) and after (gum pockets rendering the fruits unmarketable). Furthermore, the presence of the causal agent of impietratura restricts to a great extent the growth of the branches and foliage, and so decreases the yield of the trees.

Finally, we have observed the disease only on oranges, and in one doubtful instance, on tangelo. On the other hand, Ruggieri describes it on Marsh grapefruit. One will have to see whether other species, such as mandarins and lemons, are susceptible.

A cooperative investigation by research groups in the countries of the Mediterranean area seems to be one of the ways to get a fast answer to the numerous questions posed by the existence of impietratura.

Literature Cited

1. RUGGIERI, G. 1955. Le Arance impietrate. Riv. Agrumicoltura 1 (2): 65-69 (1 color plate).