

Risk of Establishment of Non-Indigenous Diseases of Citrus Fruit and Foliage in Spain: An Approach Using Meteorological Databases and Tree Canopy Climate Data

A. Vicent^{*,1} and J. García-Jiménez¹

Based on macroclimate comparisons of monthly means of temperature and rainfall, the Mediterranean-type climate might be considered unfavorable for the establishment of the quarantine pathogens of fruit and foliage of citrus regulated by the EC Council Directive 2000/29. The presence of free water on the canopy during periods with temperatures favorable for disease development seems to be limited by the characteristic rainless summer. However, our field study showed that due to the formation of dew, rainfall and rain days were not positively correlated with canopy wetness. Dew periods were quite frequent during summer nights with temperatures over 15°C and even 20°C. Nevertheless, wetness periods were seldom continuous and they were usually interrupted by dry periods approximately 10–14 h long. In contrast to some endemic foliar pathogens such as *Alternaria alternata*, no data are currently available on the performance of these non-indigenous pathogens under interrupted wetness conditions. Due to the lack of rain during the summer in semi-arid areas, the natural spread of rain-disseminated citrus pathogens, such as *Elsinoë* spp. and *Xanthomonas axonopodis* pv. *citri*, might be rather limited. However, windborne pathogens, such as *Guignardia citricarpa* and *Pseudocercospora angolensis*, would have considerable potential for dissemination under the Mediterranean climate. We consider that more information about the effect of microclimate on the epidemiology of these diseases is needed to estimate accurately their risk of establishment in Spain and in other citrus-growing countries of the Mediterranean Basin.

KEY WORDS: Climate matching; exotic pathogens; regulatory policy.

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¹Instituto Agroforestal Mediterráneo, Universidad Politécnica de Valencia, Camino de Vera s/n, 46022 Valencia, Spain. *Corresponding author [Fax: +34-96-3879269; e-mail: anvici@eaf.upv.es].