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Frost damage in citric and olive production as the result of climate degradation

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Low temperature is one of the chief limiting factors in plant distribution. Freezing temperature shortens the growing season and may lower the yield and quality of any number of fruit crops. Minimum temperatures records for the Spanish region of Murcia were studied as limiting factor in fruit production. An analysis of temperature series since 1935 showed that the range of the absolute minimum temperatures (Tmin) on frost days in the target year, namely -0.5 ºC to -4.0ºC, was statistically similar to the range recorded in 1993, while the mean minimum temperatures (tmin) were found to have risen. The historical series also showed the mean minimum temperatures (tmin) to have increased, however. Through 1985, tmin ranged from 4.0 to -2.0 ºC, depending on the area, while these limits shifted in more recent years to 7.0 - 0.5 ºC. This increase in mean temperature produced that the frost episodes in March 2004 was considered by lemon, mandarin and olive producers as the worst in many years for frost damage since the minimum temperature was reached in a more sensitive phenological stage, despite the statistical evidence that similar freezing temperatures had been reached on similar dates in other years.