



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Effectiveness of Bumblebee Pollination in Anti-Frost Heated Tomato Greenhouses in the Mediterranean Basin*

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Abstract: Turkey has 22,000 ha of greenhouse area, and about 51% of vegetable greenhouses are used for tomato production. In Mediterranean countries generally greenhouses are not regularly heated at optimal levels. Fruity vegetables in winter have a problem of insufficient pollination due to low temperatures and isolated atmosphere. The aim of this study was to investigate the effectiveness of bumblebee (*Bombus terrestris*) pollination in tomato production in anti-frost heated greenhouses in the Mediterranean basin. Three fruit set applications, namely bumblebee, vibration and growth regulator, were used. Bumblebee pollination was compared to 2 other techniques that are commonly used in tomato greenhouses. The tomato varieties F 144, P 198, F 248 and Vivia were grown during the winter cultivation period. The heating system of the greenhouses was only used in the case of emergencies to maintain the temperature above 5 °C. The results showed that the bumblebee can be an efficient pollinator of tomato flowers in anti-frost heated greenhouses during winter in the Mediterranean basin. Bumblebee pollination increased the yield by 90% and 61% over vibration and growth regulator applications. Bumblebee pollinated tomato fruits were heavier than vibrated and growth regulator applied ones by 41% and 9%, respectively. In conclusion, bumblebee pollination should be used instead of growth regulators and vibration for increased yield and more marketable fruits.

Key Words: *Lycopersicon esculentum*, greenhouse cultivation, *Bombus terrestris*, pollination, fruit set

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