

The role of air temperature on phenophases of apple (*Malus domestica* L. cv. Starking Delicious) in Zagora, Central Greece

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It is well known that the phenological behavior of plants is influenced in a high degree by air temperature. The purpose of this study is to investigate the impact of air temperature on the timing of the main phenophases of apple, fruit tree with great economic importance in Greece. Phenological data of apple (*Malus domestica* L. cv. Starking Delicious) at the region of Makrirachi (altitude 350 m), Zagora, Prefecture of Magnisia, Periphery of Thessaly Central Greece, have been collected from the Peripheral Center of Plant Protection and Quality Control of Volos for the period 1996-2004, in order to evaluate the timing of following phenophases: end of bud swelling, bud burst-green tips (BB), first leaves separating, green bud stage - leaf burst (GB), pink bud stage-flower petals elongating-visible sepals slightly open (PB), 'ballon' stage (SB), beginning of flowering (BF), full flowering, beginning of petal fall, end of flowering-all petals fallen, 'hazelnut' stage-fruit size up to 20 mm (HS) and 'walnut' stage-fruit size up to 40 mm (WS). At the same time, air temperature data were monitored from a meteorological station near the study area. Statistics included correlation between the timing of phenophases on apple trees and air temperature. Also, correlation coefficients were calculated between the timing of the examined phenophases. For the prognosis of the timing of the HS (as calculated from period between BF and HS timing), a simple regression model is presented on the basis of sum of maximum temperatures from the period between BB and BF timing. It was found that the timing of phenophases GB, PB, SB and BF was correlated negatively with average temperature of March-April, in a slightly higher degree than that of March. Also, it was noticed that the air temperature of May was correlated positively with the timing of PB until to WS which can be explained by the fact of a declined trend of average temperature of May from 1996 to 2004, not present in the cases of other spring months. The correlation coefficients between the timing of various apple phenophases, in general, decreased as the time period increased from adjacent to distant phenophases. The timing of HS phenophase can be predicted with adequate accuracy by a simple quadratic equation

which may be useful for a better programming on apple protection operations such as the control of the first generation of codling moth (*Cydia pomonella* L.) populations.