

Determination of Chilling and Heat Requirements of Different Pecan Cultivars

F. Agamgard*, M. Rahemi and K. Vahdati¹

Pecan is one of the most important nut fruits of subtropical regions that has very high commercial value. In this research, chilling and heating requirements of 16 pecan cultivars (GraTex, Peruque, Comanche 4M, 10J, Wichita 6J, Mohawk, Mahan, Stuart 2J, 3J, Stuart 4J, GraKing, Choctaw, Apache, 6M, Wichita 7J, and Comanche 5M) were carried out at the Saidabad Agricultural Research Center of Dezful during 2014–15. The Utah model and chilling treatments of cuttings were used to determine chilling requirement of cultivars. Heat requirements were determined by growth degree day (GDD) method. The experiment was a randomized design factorial with 16 cultivars and 11 chilling treatments for 0, 150, 300, 450, 600, 750, 900, 1050, 1200, 1500 and 1800 hours at $4^{\circ}\text{C} \pm 1$ and three replications. To calculate the chilling requirement of pecan cultivars in natural conditions, meteorological data of Safiabad station were used. The results showed that chilling requirement was lower than 200h for 'GraKing', 'Wichita 6J' and 'Wichita 7J' and higher than 800h for 'Comanch 5M' and heat requirement were 416GDD for 'Apache' and 625GDD for 'Comanch 5M'. In all of cultivars, heat requirement varied inversely with chilling accumulation hours and they required at least 500h with $>18^{\circ}\text{C}$ heating for spring budbreak. Finally, results of this study showed that 'Wichita 6J', 'GraKing', '10J' and 'Apache' were suitable for subtropical regions of Iran with 300h chill units and 'Comanch 5M', 'GraTex' and '6M' were suitable for regions with 400-600h chill units.

Keywords: Budbreak, *Carya illinoensis*, Utah model.

1. Former Ph.D. Student of Horticultural Science and Assistant Professor of Horticultural Sciences Research Institute (HSRI), Safiabad Agricultural and Natural Resources Research and Education Center, Professor, Department of Horticultural Science, School of Agriculture, Shiraz University, Professor, Department of Horticulture, Aburaihan Campus, University of Tehran, Tehran, Iran, respectively.

* Corresponding author, Email: (ajamgard.dezful@yahoo.com).