

Terral de Vicuna, a Foehnlike Wind in Semiarid Northern Chile: Meteorological Aspects and Implications for the Fulfillment of Chill Requirements in Deciduous Fruit Trees

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Resumen

The terral de Vicuna is a warm and dry wind that flows down the Elqui Valley in north-central Chile typically at dawn and early morning. Given that most terral episodes occur in austral winter when chill accumulation by deciduous fruit trees proceeds, negative effects on agriculture may be expected. During 11 (2004-14) winters a meteorological characterization of terral winds and the assessment of their impact on chill accumulation, by the modified Utah Model and the Dynamic Model, were performed. Within this period, 67 terral days (TD) were identified as those in which nighttime to early morning wind direction and speed, air temperature, and relative humidity reached defined thresholds on an hourly basis (terral hours). Most frequent TD featured 6-9 consecutive terral hours; duration is considered here as a proxy for their intensity. Synoptic-scale meteorological analysis shows that 65% of moderate and strong terral events develop as a cold, migratory anticyclone drifts poleward of the study area, coinciding with the onset of a midtropospheric ridge over central Chile, bringing southwest winds on top of the Andes (similar to 500-hPa level). The remaining 35% are either associated with 500-hPa easterlies (foehn like), with prefrontal conditions ahead of a trough driving northwest 500-hPa winds, or with transitional 500-hPa westerlies. Assessments of chill accumulation during TD show that, although present average and cold winter conditions do not represent a major TD hazard to local agriculture, lower chill accumulation associated with anomalously high nocturnal temperatures could be significantly more important during present and future warmer winters.

Palabras clave

KeyWords Plus: HEAT REQUIREMENTS; TEMPERATURE-DEPENDENCE; DORMANCY BREAKING; REST COMPLETION; PISTACHIO TREES; DYNAMIC-MODEL; AUSTRALIA; IMPACT; 30-DEGREES-S; PREDICTION

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Editorial

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