Development and implementation of a standardized frost hazard index

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Revista Argentina de Agrometeorología RADA, v. XVI (2025): 29–38

Summary

Frosts represent one of the main agroclimatic risk factors. Their hazardousness depends not only on the minimum temperature reached, but also on its relationship with historical records for the same time and place. This paper presents the Standardized Frost Hazard Index (SFHI) and proposes a categorization of frosts by hazard level, based on SFHI value ranges. The index was then applied to analyze and classify agrometeorological frosts that occurred during the beginning of the 2025 winter season in six locations in central and northern Argentina. The results show that the southernmost locations had more frost cases and mostly with low hazard, while in the northern locations, half of the events were of high hazard. Finally, a case study was conducted for a particular cold wave event, with minimum temperatures as low as -7°C, resulting in an extreme hazard classification for each of the analyzed locations and recurrence times between 50 and 150 years.

Key words: agrometeorology; risk; adversities; cold