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**Plant Production Science**

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[\[PDF \(835K\)\]](#) [\[References\]](#)**Increased Cell-Wall Mass and Resistance to Freezing and Snow Mold during Cold Acclimation of Winter Wheat under Field Conditions**[Shuichi Sugiyama](#)<sup>1)</sup> and [Tomonori Shimazaki](#)<sup>1)</sup>

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**Abstract:** Accumulation of soluble carbohydrates plays an important role in enhancement of resistance to freezing and snow mold of plants during cold acclimation. Nevertheless, few studies have examined whether changes in cell wall properties are involved in enhancement of resistance during cold acclimation. In this study, four winter wheat cultivars were sown in a field on six different dates during August-October, and their resistance to freezing and snow mold were compared in relation to soluble carbohydrate content and cell-wall mass in leaves. Resistance to freezing and snow mold was much higher in the plants sown on 23 September than in those sown on 9 September. The percentage of cell-wall mass in leaf to total dry mass (%CW) and water-soluble carbohydrate content also increased considerably during 9-23 September. Multiple regression analyses revealed that %CW contributed significantly to freezing resistance, whereas total water-soluble carbohydrate content contributed significantly to snow mold resistance. These results suggest that increased % CW enhances freezing resistance during cold acclimation.

**Keywords:** [Carbohydrate accumulation](#), [Cell-wall mass](#), [Cold acclimation](#), [Freezing resistance](#), [Snow mold resistance](#)

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