

# What is frost and when does it affect wheat yields?

## Frost can affect wheat at all stages of development, reducing yield and quality

Cereal crops are most susceptible to frost damage during and after flowering but are also susceptible from stem elongation throughout grain filling.

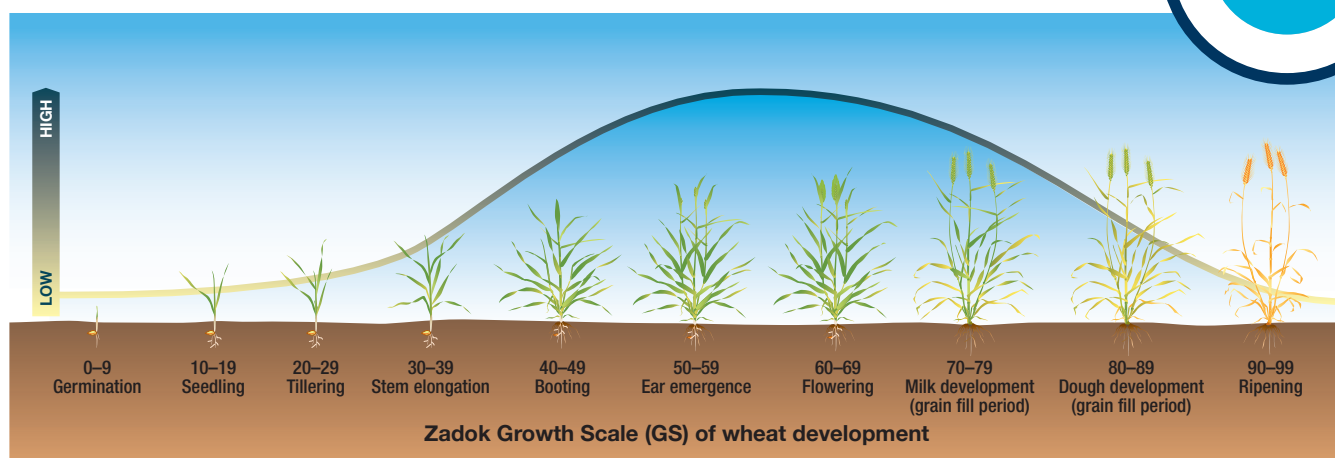
Leaves, stem, anthers, ovaries and grain can all be affected by frost. A plant may suffer stem, flowering and grain frost, especially if a series of frost events occur throughout development.

**Cold damage** occurs when plants are exposed to temperature less than 5°C down to -2°C. If this occurs during pollen development (Z39 – 45) it can cause spikelet damage.

**Desiccation damage** occurs when ice forms on the outside of the leaves at temperatures from 0°C to -2°C. Moisture is drawn from the leaves leaving them dry and brittle, subsequently dying at the tips.

**Freezing damage** usually occurs at temperatures below -2°C when there is rapid ice nucleation and ice crystals form within the leaf. The ice crystals physically rupture cell walls and membranes within the cells causing physical damage. Damage can be seen once thawed as dark green water soaked areas. Ten days after a frost event, bleached leaves, stems, heads and reproductive tissue might be evident.

**Figure 1** At what temperature does frost damage occur in a cereal crop?



**Figure 2** Susceptibility of wheat to frost during the development cycle

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