Grain dormancy and grain moisture interact to induce a transient period of elevated susceptibility to pre-harvest sprouting in wheat under cool maturation conditions in Western Australia.

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Abstract

Australian farmers predominately grow white wheat cultivars with inherently low grain dormancy. Although grain maturation typically occurs under hot and dry conditions resulting in a low risk of pre-harvest sprouting (PHS), wet harvest conditions do occur in some seasons which can lead to significant PHS and associated downgrades in crop quality.

A trend towards earlier sowing of wheat in Western Australia has resulted in maturation occurring earlier in the season than from traditionally later sowing dates. Field research conducted over multiple seasons has demonstrated the increased incidence of PHS resulting from the cooler and wetter conditions generally associated with this earlier maturation, with evidence of precocious germination from soon after physiological maturity (well before harvest maturity). This has been attributed to a transient period of increased susceptibility to rainfall that occurs when elevated grain moisture is prolonged by cool conditions and the rainfall required to stimulate germination is reduced. PHS risk subsequently declines as the grain dries (requiring greater exposure to rainfall to stimulate germination).

These findings contravene expectations that PHS risk progressively increases as grain dormancy declines as the crop extends past physiological maturity. This has important implications for the management of pre-harvest sprouting through agronomy and plant breeding.