

PHENOLOGIES OF MAIN STEM AND TILLERS OF SPRING WHEAT UNDER DIFFERENTIAL SUPPLY OF N AND WATER DURING TILLERING

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ABSTRACT

The study was conducted to document relative phenologies of main stem and tillers of different orders in spring wheat under varying levels of N and water supply in order to understand the phenomena of convergence of development and synchronous ripening of all the fertile tillers of wheat. It may also be useful for modeling of wheat canopy development. Three levels of nitrogen and three levels of water supply were established at three- leaf stage by maintaining 20° C constant day and night temperature and a constant 14 h photoperiod. Each tiller position was tagged and number of leaves on main stem and each of tiller positions were recorded daily. Leaf appearance rate was derived by regressing number of leaves in Haun scale vs. cumulative thermal time since sowing for each levels of N and water supply for main stem and tillers. The results showed that spring wheat plant reacted to N and water supply deficiencies by skipping tiller positions in the hierarchy but whichever the tiller position was produced had the same number of leaves in Haun scale for each of nitrogen and water supply treatments. The comparison of leaf appearance rate between early-formed (TM, T1, T2, T10 and T11), middle in hierarchy (T3 and T20) and late-formed tiller (T4 and T30) showed that middle order tiller leaf appearance rate was slightly faster than the early-formed tillers but leaf appearance rate of late-formed tillers T4 and T30 was about twice as fast as that of early-formed tillers. The progressively faster leaf appearance rate at each of successive tiller position is strong evidence that the convergence of development occurred even during the process of tillering. However, relative phenologies of main stem and tillers of spring wheat remained unaffected by varying the supply of nitrogen and water.

Key Words: Wheat, Nitrogen and Water, Main stem, Tillers, Leaf appearance rate, Convergence, Development.