



# Wheat Water Management –Water stress and Waterlogging

Too much or too little water (through poor irrigation practices or rainfall) reduces wheat yields.

Stress	Too little water (Water stress)	Too much water (Waterlogging)
<b>Causes</b>	Drought or irrigation not often enough or deep enough.	Excessive rainfall, over irrigation due too often and/or too much water added.
<b>Symptoms</b>	<p>Poor crop stand, reduced tillering, rolled or wilted leaves, dull grey-green leaves, leaves dying (especially the tips), lower grain weight.</p>  <p>CYMMIT</p>	<p>Bright yellow or dead lower leaves, pale yellow upper leaves. Roots may be discolored (brown).</p>  <p>A. Samad, C.A. Meisner, M. Saifuzzaman, and M. van Ginkel 2011, for CYMMIT</p>
<b>Effects on Plant and Soil</b>	<ul style="list-style-type: none"> <li>• Reduced root growth</li> <li>• Reduced plant growth and yield.</li> </ul>	<ul style="list-style-type: none"> <li>• Roots stop growing and die.</li> <li>• Roots may regrow after waterlogging reducing plant growth and yield.</li> <li>• Nitrogen (N) is leached or lost as gas.</li> <li>• Some elements (like Fe, Mn and Al in acidic soils) can go into soil solution and become toxic.</li> </ul>
<b>Critical stages</b>	Flowering is the most critical stage for water stress, but early stress will reduce germination, emergence and plant tillering.	Wheat is affected by waterlogging at all stages.
<b>Diagnosis</b>	<ul style="list-style-type: none"> <li>• <b>History.</b> Check rainfall and irrigation records – if they exist – for timing and amount.</li> <li>• <b>Dry soil.</b> See fact sheet on evaluating soil moisture by feel.</li> <li>• <b>Rolled or wilted leaves.</b></li> <li>• <b>Leaves with burnt edges or “scorch” marks.</b> Leaves that are stressed are hotter than leaves that can transpire.</li> <li>• <b>Reduced number of tillers.</b> Typically a normal healthy crop has one fewer tillers than leaves on the main stem.</li> <li>• <b>Color change.</b> Water stressed crops dry and change color quicker than crops with enough water. Crops with enough water will typically have at least 2 green leaves after heading.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>History.</b> Check rainfall and irrigation records – if they exist – for timing and amount.</li> <li>• Puddled or standing water.</li> <li>• Wilted plants even though the soil is wet.</li> <li>• pale with yellow tips on older leaves, especially in lower or wetter areas of the field.</li> <li>• The crop appears to be N deficient (pale green) even though fertilizer was applied (See picture below).</li> <li>• Soil may smell unpleasant (like stagnant water).</li> </ul>  <p>OhioState University</p>
<b>What can be done?</b>	<ul style="list-style-type: none"> <li>• Improve irrigation timing, amount and distribution across the field. schedule,</li> <li>• Level soils</li> </ul>	

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Reference: Wheat doctor CYMMIT; CSIRO Plant Industry “Unravelling the roots of waterlogged wheat ” 2007

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