### Wheat Water Management – Water stress and Waterlogging

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

<table>
<thead>
<tr>
<th>Stress</th>
<th>Too little water (Water stress)</th>
<th>Too much water (Waterlogging)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Causes</strong></td>
<td>Drought or irrigation not often enough or deep enough.</td>
<td>Excessive rainfall, over irrigation due too often and/or too much water added.</td>
</tr>
<tr>
<td><strong>Symptoms</strong></td>
<td>Poor crop stand, reduced tillering, rolled or wilted leaves, dull grey-green leaves, leaves dying (especially the tips), lower grain weight.</td>
<td>Bright yellow or dead lower leaves, pale yellow upper leaves. Roots may be discolored (brown).</td>
</tr>
</tbody>
</table>
| **Effects on Plant and Soil** | • Reduced root growth  
• Reduced plant growth and yield. | • Roots stop growing and die.  
• Roots may regrow after waterlogging reducing plant growth and yield.  
• Nitrogen (N) is leached or lost as gas.  
• Some elements (like Fe, Mn and Al in acidic soils) can go into soil solution and become toxic. |
| **Critical stages** | 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. |
| **Diagnosis** | • **History.** Check rainfall and irrigation records – if they exist – for timing and amount.  
• **Dry soil.** See fact sheet on evaluating soil moisture by feel.  
• **Rolled or wilted leaves.**  
• **Leaves with burnt edges or “scorch” marks.** Leaves that are stressed are hotter than leaves that can transpire.  
• **Reduced number of tillers.** Typically a normal healthy crop has one fewer tillers than leaves on the main stem.  
• **Color change.** 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. | • **History.** Check rainfall and irrigation records – if they exist – for timing and amount.  
• **Puddled or standing water.**  
• **Wilted plants even though the soil is wet.**  
• Pale with yellow tips on older leaves, especially in lower or wetter areas of the field.  
• The crop appears to be N deficient (pale green) even though fertilizer was applied (See picture below).  
• **Soil may smell unpleasant (like stagnant water).** |

| **What can be done?** | • Improve irrigation timing, amount and distribution across the field. schedule,  
• Level soils |

---

**Prepared by Maria P. Santibanez and Mark Bell, 2012**

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

**For more information visit:** [http://ip.ucdavis.edu](http://ip.ucdavis.edu)

**Copyright © UC Regents Davis campus, 2012. All Rights Reserved.**