

Every year corn producers somewhere struggle with drought conditions. The extent of corn yield loss is determined by stage of growth when drought hits as well as the hybrid's ability to withstand drought stress.

Leaves rolling at midday is the corn plant's defense mechanism when water is limited.



Water needs and drought effects

Estimated corn evapotranspiration and yield loss per stress day during various stages of growth

Growth stage	Evapotranspiration (inches/day)	% yield loss per day of stress (min-ave-max)
Seedling to 4 leaf	0.06	---
4 leaf to 8 leaf	0.10	---
8 leaf to 12 leaf	0.18	---
12 leaf to 16 leaf	0.21	2.1 - 3.0 - 3.7
16 leaf to tasseling	0.33	2.5 - 3.2 - 4.0
Pollination (R1)	0.33	3.0 - 6.8 - 8.0
Blister (R2)	0.33	3.0 - 4.2 - 6.0
Milk (R3)	0.26	3.0 - 4.2 - 5.8
Dough (R4)	0.26	3.0 - 4.0 - 5.0
Dent (R5)	0.26	2.5 - 3.0 - 4.0
Maturity (R6)	0.23	0.0

Derived from Rhoads and Bennett (1990) and Shaw (1988). From: *What Happens Within The Corn Plant When Drought Occurs?*, Joe Lauer, University of Wisconsin-Extension, 8/20/03. www.uwex.edu/ces/ag/issues/drought2003/corneffect.html.

Irrigation Treatment	Yield %*	Irrigation Treatment	Yield %*
Well-watered	100	Severe water stress: VT	51
Severe water stress: V6	91	Severe water stress: R3	76

*Yield expressed as % of well-watered treatment. Adapted from Cakir, 2004.

Common Drought-Induced Nutrient Deficiency Symptoms:



Potassium Deficiency

Yellow with necrosis on outer leaf margins.



Nitrogen Deficiency

Yellow with necrosis up the midrib. Lower leaves.

Nutrients enter plant roots by:

1. Mass flow
 2. Diffusion
 3. Root interception
- Without water roots may not grow well and nutrient movement in the soil is limited.
 - Nutrient remobilization in the plant will occur when corn can't access nutrients in the soil due to poor root growth or lack of soil moisture.



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