



EM4821

Visual Crop Moisture Stress Symptoms

Plants need ample soil moisture throughout the growing season to obtain high yields and high crop quality. All crops, particularly perennial crops, will get off to a better start early in the season if root zone soil moisture is brought up to field capacity. Excessive early irrigation can be detrimental, however. It can cause cold soil temperatures, inhibit new root growth, and leach nutrients.

Monitor soil moisture early in the season (March) and apply only enough water to bring the soil to field capacity. There are specific growth stages when many crops will suffer significant yield loss or quality reductions if stressed for moisture.

Plants show moisture stress by a number of symptoms. Unfortunately, by the time most of these appear, it may be too late and the damage already done. Use the following visual moisture stress

symptoms to monitor your crops and watch for “hot” spots in the field. Do not wait for these symptoms to appear on large portions of a field to apply an irrigation. Irrigation timing is ideally accomplished by balancing soil moisture content with crop water use and irrigation water applied; it requires routine checking of the root zone soil moisture.

Information on soil moisture monitoring and crop evapotranspiration from Washington’s Public Agricultural Weather Stations (PAWS) and Washington Irrigation Scheduling Expert (WISE) are available on the Scientific Irrigation Scheduling (SIS): web page <http://sis.prosser.wsu.edu>

Drought advisories and other Washington State University Cooperative Extension Bulletins are available online at <http://pubs.wsu.edu> Type “drought” in the search box for downloadable files.

Crop	Moisture stress symptoms	Critical growth periods	Other factors
Alfalfa (hay)	Dull, bluish green color, wilting, and firing of leaves	Early spring and after each cutting	Minimize irrigation off-time at each harvest
Beans	Wilting	Bloom and fruit set	Yield reduced if water is short at bloom/set
Corn (grain)	Dull green color, curling or rolling of leaves by mid-morning	Tasseling and silk stages through grain filling	Yield reduced if water is short at tasseling
Potatoes	Dark green color, wilting during the heat of the day	Tuber formation and growth	Avoid large fluctuation in soil moisture. Stress followed by adequate water (or vice versa) causes quality problems

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Small grains	Dull green, curled leaves, firing of lower leaves	Boot through soft dough	Irrigation needs are reduced dramatically after soft to medium dough stage
Onions	Dull color, wilting	Bulb formation	Keep wet during bulb formation; stress at three to seven leaf stage increases multiple centers. Let soil dry near harvest
Grapes (Concord)	Dark, grayish green color, wilted shoot tips	Flowering through fruit set, formation and filling of berries, berry sizing	Remove or suppress cover crops; control weeds
Turfgrass/lawns	Dull grayish green color, imprints from foot or lawn-mower which remain visible, that is, grass does not rebound	Early in spring	Kentucky bluegrass is shallow rooted. Avoid overwatering as it promotes shallower roots and invasion by undesirable species
Tree fruits	Dull leaf color, leaf rolling without recovery by early to mid-evening hours	Full bloom to 4 weeks after bloom, fruit set, last 2 weeks to 30 days prior to harvest	Reduce total orchard water use by controlling weeds and suppressing cover crop growth
Tomato	Grayish green color, droopy, wilted, leaf rolling	After fruit set	Wilt and leaf rolling also caused by diseases
Sweet corn	Dull green color, curling, rolling of leaves	Tasseling, silking ear filling stages to harvest	Quality greatly impacted if water stressed
Grass hay and pasture	Dull, grayish green color	Early spring through first harvest for hay, start of regrowth	Avoid heavy grazing of pasture during spring and fall; control weeds
Hop	Droopy leaves, dull color on some varieties	Early growth before training, flowering period, prior to harvest	Excessive early irrigations can do more damage than good
Mint	Dull green color, turns red if overirrigated	Early growth period in spring, needs adequate water all season as canopy develops	Very shallow-rooted, requires frequent irrigation
Asparagus	Dull, grayish green fern, weak, spindly new shoots	Adequate moisture needed for entire fern growth period after harvest	Fill root zone to field capacity in early spring before harvest begins
Grapes (Vinifera)	Shoot and tendril tips turn brown, tendrils are not turgid	Flowering, fruit set, berry sizing	More drought-tolerant than Concord grape; Regulated Deficit Irrigation (RDI) can be beneficial

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