

California Wheat

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Weekly Wheat Bulletin

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*The Weekly Wheat Bulletin is designed to share quick, informal and reliable information about the state's wheat crop and disease conditions. Comments forwarded by Thursday morning of each week will be posted in the Bulletin for distribution Thursday evening. Archived copies of the 2007 Wheat Bulletin may be accessed on the California Wheat Commission website:
www.californiawheat.org*

Questions and Answers:

Question: For those areas experiencing moisture stress, what should be considered when deciding when to apply water to the wheat crop?

Answer: Questions about when growers may have to water their wheat crop; dates/conditions, etc.: Part 5 (Irrigation and Water Relations) of the new *Small Grain Production Manual* (now accessible from the UC Small Grains Website, <http://agric.ucdavis.edu/crops/cereals/ce-real.htm>) addresses the situation of moisture stress early in the growing season and the pros and cons of irrigating this time of year.

In most seasons irrigation is not necessary in the winter in the Central Valley and surrounding areas because

the wheat crop makes little growth and has little demand for moisture under the normally cool temperatures of winter. Rainfall usually is adequate to meet the crop demand (on average, late-fall sown wheat in the Central Valley and surrounding areas has a consumptive use of less than 1.5 inches of water through February). However, this is not a normal season. In order to avoid damage from severe moisture stress, my general recommendation is to prepare to irrigate, depending on the status of your crop and the moisture condition of your soil, by mid-February if significant rainfall is not forecast by that time.

Consider the following from Part 5 (Irrigation and Water Relations) of the *Small Grain Production Manual*: Early symptoms of moisture stress include dark blue-green leaf color, wrinkled leaf margins, and slight rolling or cupping of leaves. More severe symptoms include a deep blue-green canopy color, dead tissue along leaf margins, obvious leaf rolling, shortened spindly stems and small immature heads. By the time symptoms of severe moisture stress are apparent, the adverse effect on production is irreparable. Moisture-stressed plants are more susceptible to common root rot and damage by Russian wheat aphid and greenbug. Early moisture stress may cause the crop to head about 7 to 10 days prematurely; the shortened growth

period can reduce yield. Plants tend to increase tillering under early moisture stress, but many tillers die without producing grain-bearing heads. If severe moisture stress occurs during the initiation of tillers, those tillers never develop and plants may produce only the main stem (i.e. one head per plant). The spike that emerges from each tiller is formed during the tillering stage, and by the time the fifth vegetative leaf is visible on each stem the potential number of spikelets that can grow into mature kernels is determined. Plants at this stage are sensitive to moisture stress. Plants under moisture stress between the double-ridge stage (the stage in apical development when the primordia which will differentiate to become spikelets are visible) and terminal spikelet formation (see Part 2, Growth and Development) are likely to form fewer spikelets. Plants under moisture stress during stem extension form fewer florets. Plants sacrifice tillers, spikelets, and/or florets if moisture stress develops after these parts have formed but before their development is complete. As a rule of thumb, the most recently formed tillers, spikelets, or florets are sacrificed first.

Wheat has a fibrous root system. Most roots in a fully developed plant's root system are in the top two feet of soil. Under ideal conditions small grains can root to seven feet deep by the end of the season. Generally, rooting depths will be deeper in uniform soils than in soils with distinctly different soil layers. The soil layers are physical barriers to both root growth and drainage of water and aeration. Crops with deeper root zones and finer soil textures require less frequent irrigation and sometimes less total applied water. The first post-emergence irrigation is needed after

about 40 to 50 percent of the stored soil moisture in the crop root zone is consumed. The wheat root system usually is nearly fully developed by about 60-70 days after germination, reaching maximum development at about boot stage. Depending on soil texture and water holding capacity, there are 3 to 10 inches of available stored water in a 2 to 4 foot depth root zone. About 1.5 to 5 inches of soil moisture are available to sustain the crop between irrigations since about one-half of the stored water can be consumed from the crop root zone before moisture stress occurs.

Caution: If extensive rainfall follows irrigation, soils may become water-logged and anaerobic.

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General Comments:

Klamath Basin, Northern CA: "Clear, cold and dry. No measurable moisture since early December and growing concern for irrigation supplies. Winter wheat had good starting moisture but the cold winter without snow cover may impact survival. Spring planting won't begin until early April and will depend on anticipated water supply; less water = less wheat." [J W Cope, Winema Elevators Inc](#)