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Forest Health Protection and State Forestry Organizations

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Management Guide for Drought Injury

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Drought injury is caused by periods of subnormal rainfall.

Hosts:
All species

Damage

Severity of damage may vary from slight foliar injury to complete tree death. Young trees are more seriously affected than older ones. Trees in shallow soil are more readily affected than the same species in deep soil. Drought can predispose trees to increased damage and mortality from bark beetles, root diseases, and canker-causing fungi.

Key Points

- Drought injury occurs on extremely dry sites, usually after 2 or more years of moisture deficiency.
- The cumulative effect of consecutive dry periods reduces soil moisture below tree requirements.
- Injury may result from a season of extremely low precipitation.
- Drought can predispose trees to increased damage and mortality from bark beetles, root diseases, and canker-causing fungi.

Identification

Trees die from the top down and from the outside in. Injury is most severe on south and southwest slopes. The most striking symptom is discoloration of the foliage, which may be preceded by wilting. In conifers, the needles turn reddish-brown in late summer, autumn, or early winter, generally beginning from the tips of the youngest needles. In hardwoods, the leaves turn yellowish to reddish, beginning usually at the tip or margins, but occasionally midway between the main veins, progressing to brown. Leaves may turn completely brown in some situations. Premature leaf drop commonly results, and the growing season is effectively shortened.

Management

- Well managed stands are more resistant to drought than dense, overstock stands.
- Appropriate seed sources should be used for reforestation.
- Thinning and other management activities may be postponed during severe drought to avoid additional stress to retained trees.
- High value trees will better withstand the effects of drought when competing weeds are controlled and trees are properly irrigated, mulched and fertilized.

Other Reading

Miller, P. R. 1993. Abiotic Diseases. *In Diseases of Pacific Coast Conifers*.
USDA For. Serv. Ag. Handbook 521. Pacific Southwest Research Station.
Albany, CA. pp.1-32.

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