

PMS GUIDELINES FOR SELECTED CONIFERS

A considerable amount of water relations research has been done on conifer trees. Much of this information has not been compiled, compared or synthesized. Analyzing this data is an ongoing project being done at PMS Instrument Company. The similarity of the seedling responses to moisture stress has led to the development of Tables I and II. Trees are divided into three stress categories: low, medium and high (Table I). Table II indicates how each category differs in response to PMS (plant moisture stress). This preliminary stratification will be given further refinement and should be considered a place to begin when using the pressure chamber to better manage stress in conifer seedlings.

These tables have been prepared by using both research data and field experiences. We are continuing to collect data on this project and welcome information from all users of the pressure chamber.

TABLE I

CONIFER TREES CLASSIFIED BY STRESS CATEGORIES

<u>Low Stress Conifer</u>	<u>Medium Stress Conifer</u>	<u>High Stress Conifer</u>
Loblolly Pine	Douglas Fir	Juniper
Western Red Cedar	Western Hemlock	Digger Pine
Shasta Red Fir	Western Larch	Incense Cedar
Noble Fir	White Fir	
Pacific Silver Fir	Ponderosa Pine	
Engleman Spruce	Lodgepole Pine	
	White Spruce	
	Sugar Pine	
	Western White Pine	

TABLE II

ESTIMATED PLANT MOISTURE STRESS RESPONSES FOR CATEGORIES OF CONIFER TREES MEASURED IN BAR

<u>TYPICAL RANGE IN PMS LEVELS</u>	<u>PLANT RESPONSE TO STRESS</u>
<u>(MIN/MAX)* (BAR)</u>	

Low Stress Conifers	Medium Stress Conifers	High Stress Conifers	
5/8	7/10	10/12	Growth not limited by water, supply adequate, maintains maximum shoot growth.

10/12	10/15	17/20	Slight to moderate shoot growth reductions. PMS changes rapidly in changing environment. Irrigate to maximize growth and productivity. Stress limits phloem transport, leaf expansion and diameter growth.
12/14	15/20	20/25	Stomata close, shoot growth stops. Growth rate declining overall. Irrigate to maintain growth. This level of PMS required for stress response, i.e. to limit vegetative growth or stimulate flowering.

* PMS GIVEN AS RANGE FROM PREDAWN (BEFORE SUNRISE) TO MID-DAY STRESS LEVELS