

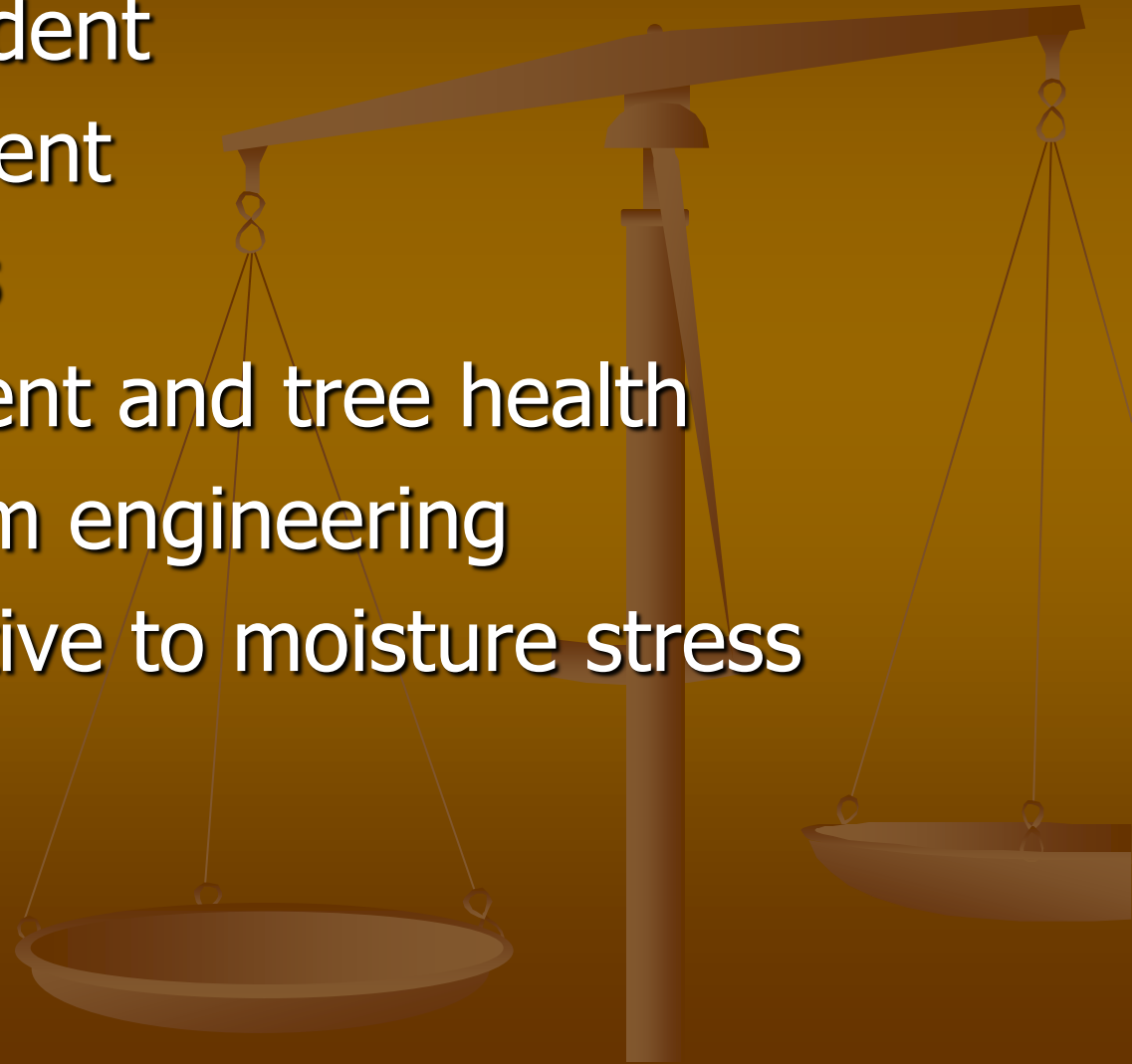
The Importance of Irrigation Management in Walnut Production



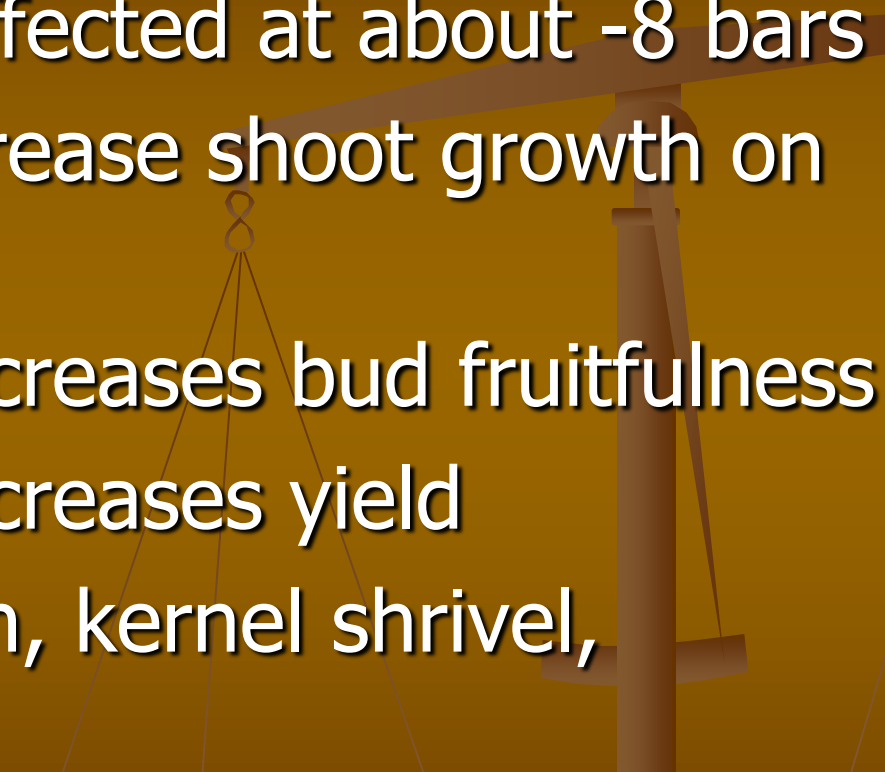
Richard P. Buchner – UCCE Tehama County

Irrigation Decisions are Challenging

- Weather dependent
- Canopy dependent
- Soil interactions
- Root development and tree health
- Irrigation system engineering
- Walnut is sensitive to moisture stress

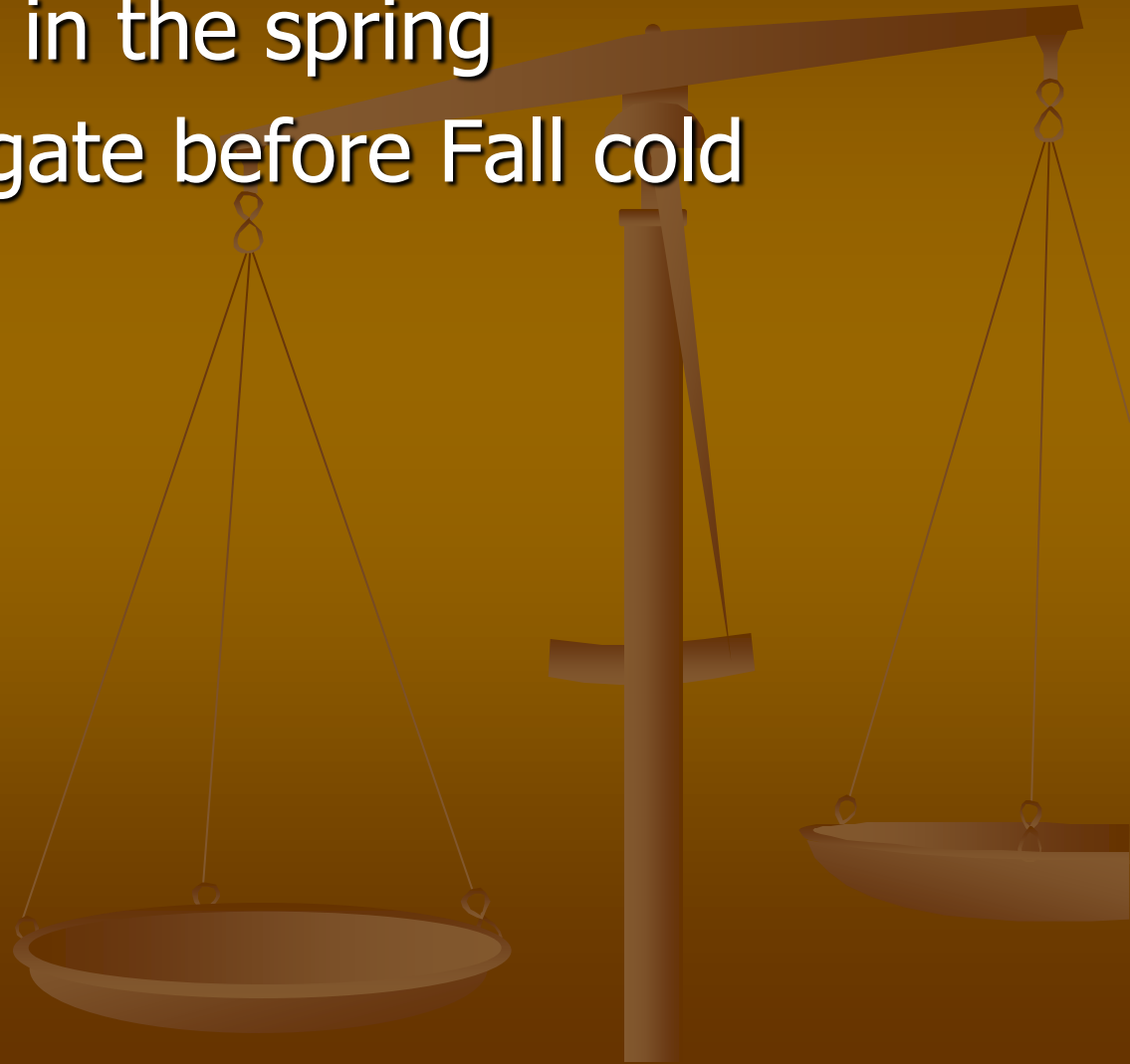


Irrigation Effects on Tree Growth and Performance

- Shoot growth affected at about -8 bars
 - Increase or decrease shoot growth on young trees
 - Water stress decreases bud fruitfulness
 - Water stress decreases yield
 - Quality (sunburn, kernel shrivel, darkening)
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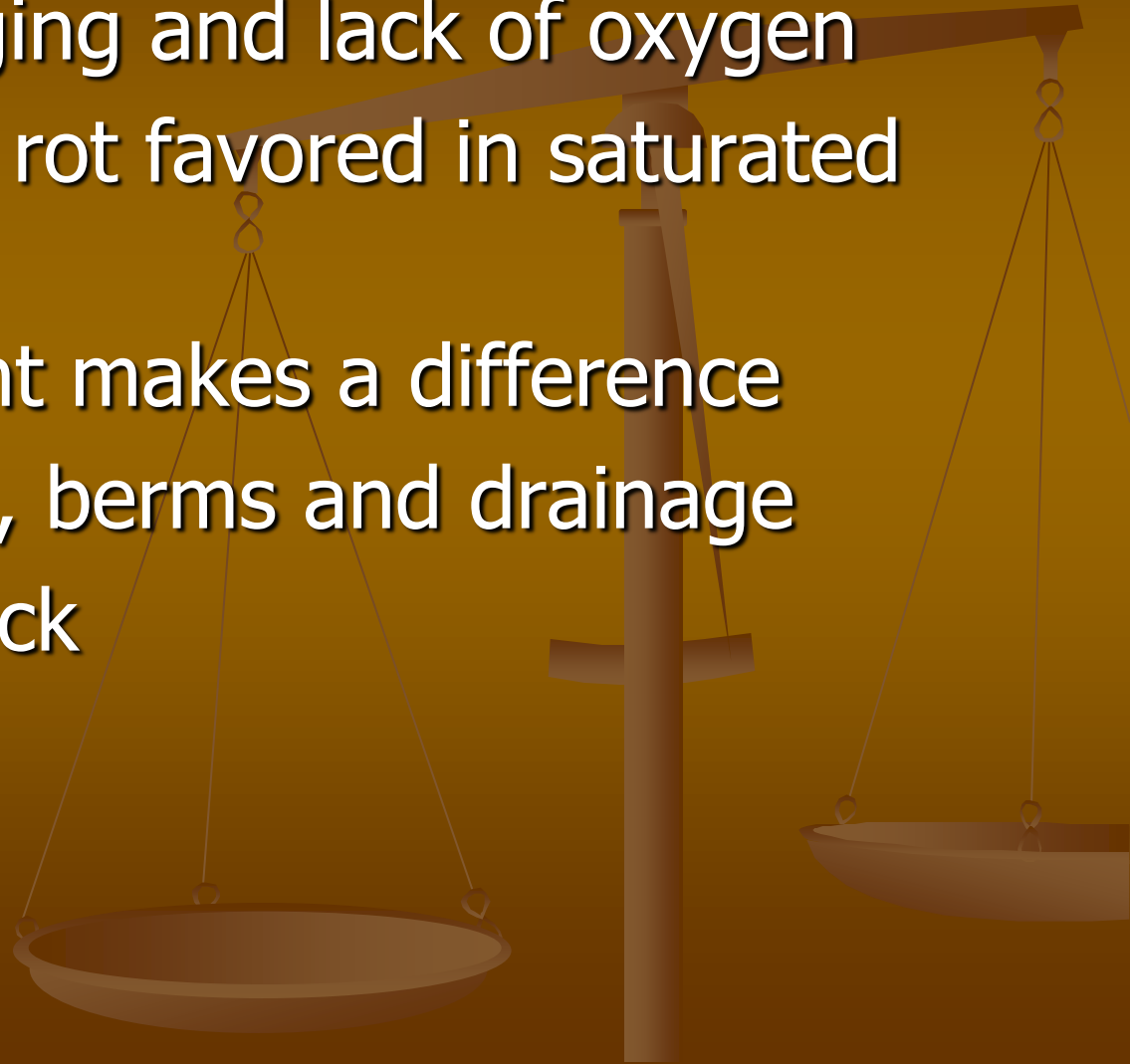
Irrigation Effects on Cold Injury

- Frost protection in the spring
- Winter kill – irrigate before Fall cold



Irrigation Effects upon Root Health

- Avoid waterlogging and lack of oxygen
- Crown and root rot favored in saturated soil (24 hrs)
- Water placement makes a difference
- Stream splitters, berms and drainage
- Paradox rootstock



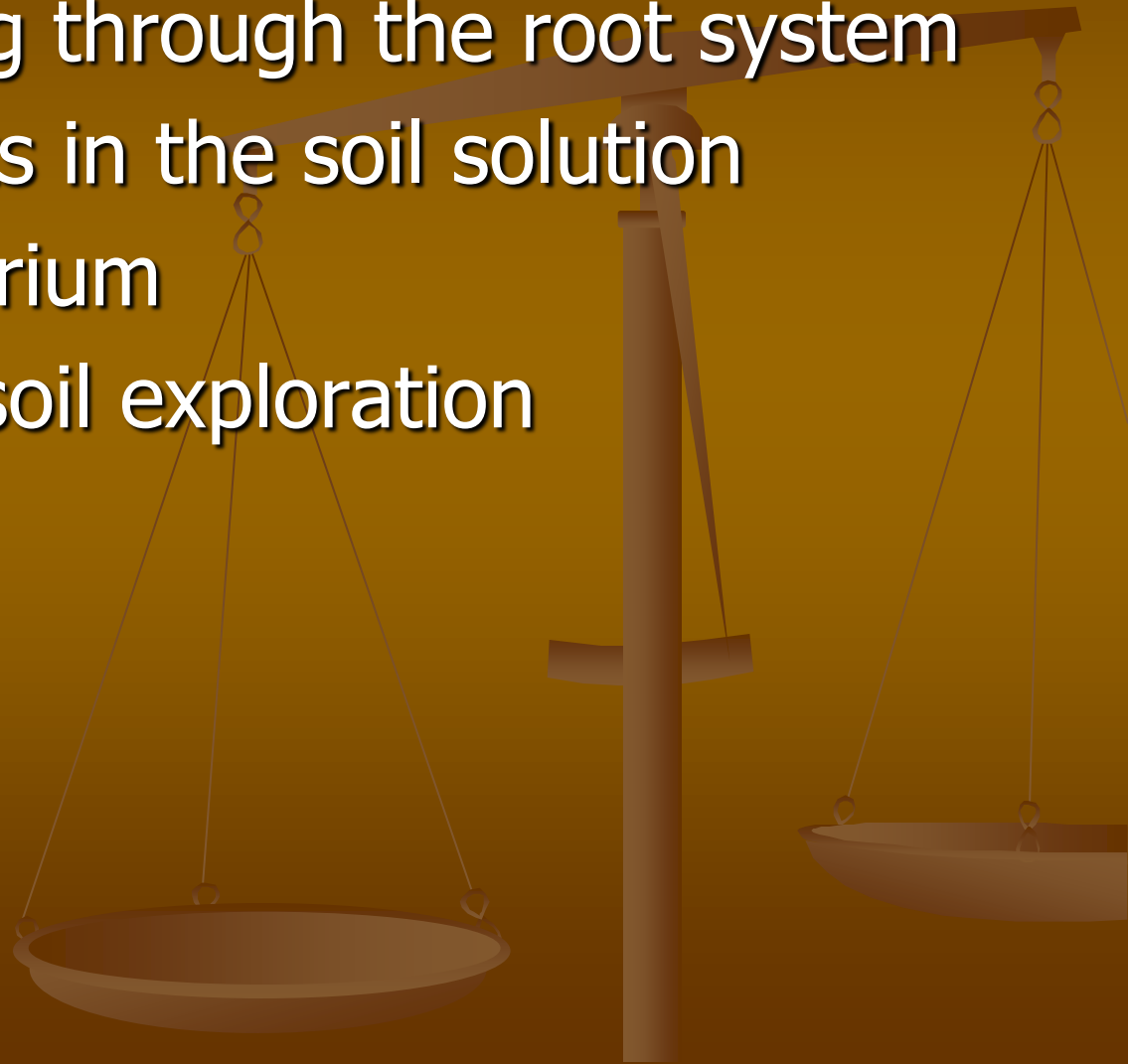
Moisture Stress Makes Walnut More Vulnerable

- Sunburn
- Phomopsis cankers
- Botryosphaeria cankers
- Branch wilt
- 1000 cankers
- Mite/insect pressure
- Deep bark canker



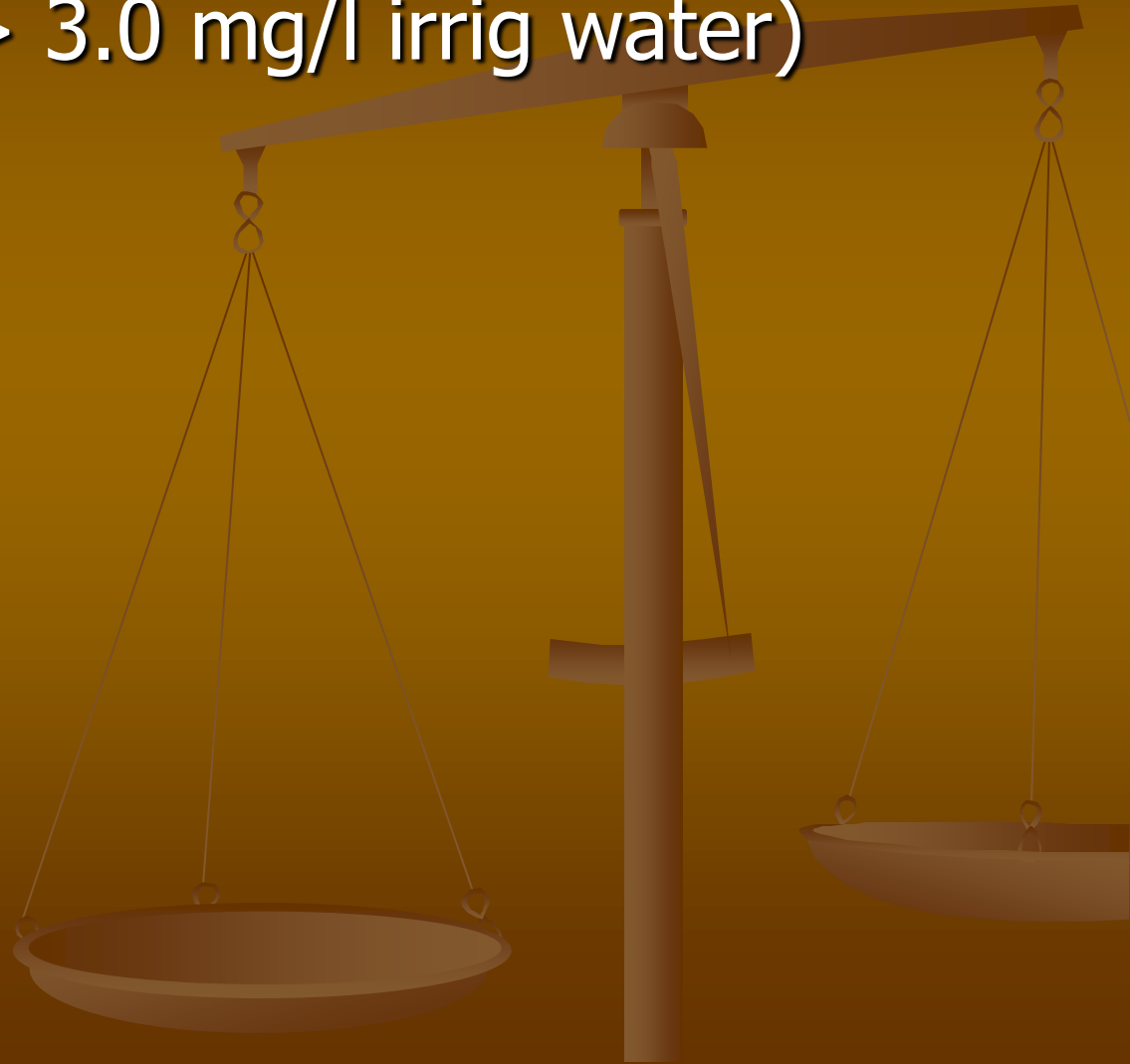
Irrigation Effects on Nutrition

- Nitrogen moving through the root system
- Mineral nutrients in the soil solution
- Soluable equilibrium
- Improved root soil exploration



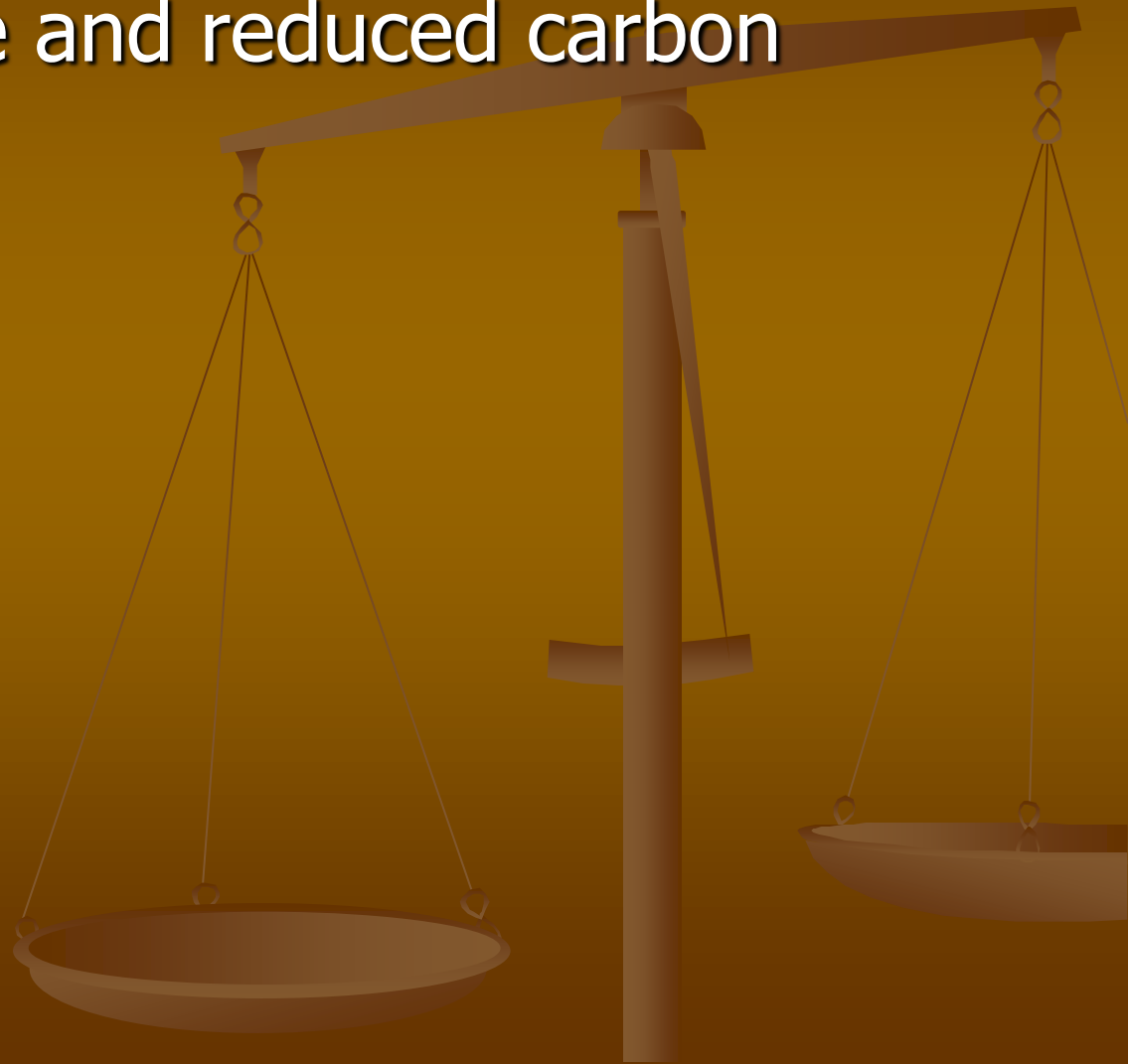
Irrigation – Toxic Ion Effects

- Boron (severe > 3.0 mg/l irrig water)
- Sodium
- Chloride



Irrigation Effects Photosynthesis

- Stomate closure and reduced carbon



Irrigation Effects on Harvest Aid

- Ethephon not suggested on stressed trees

