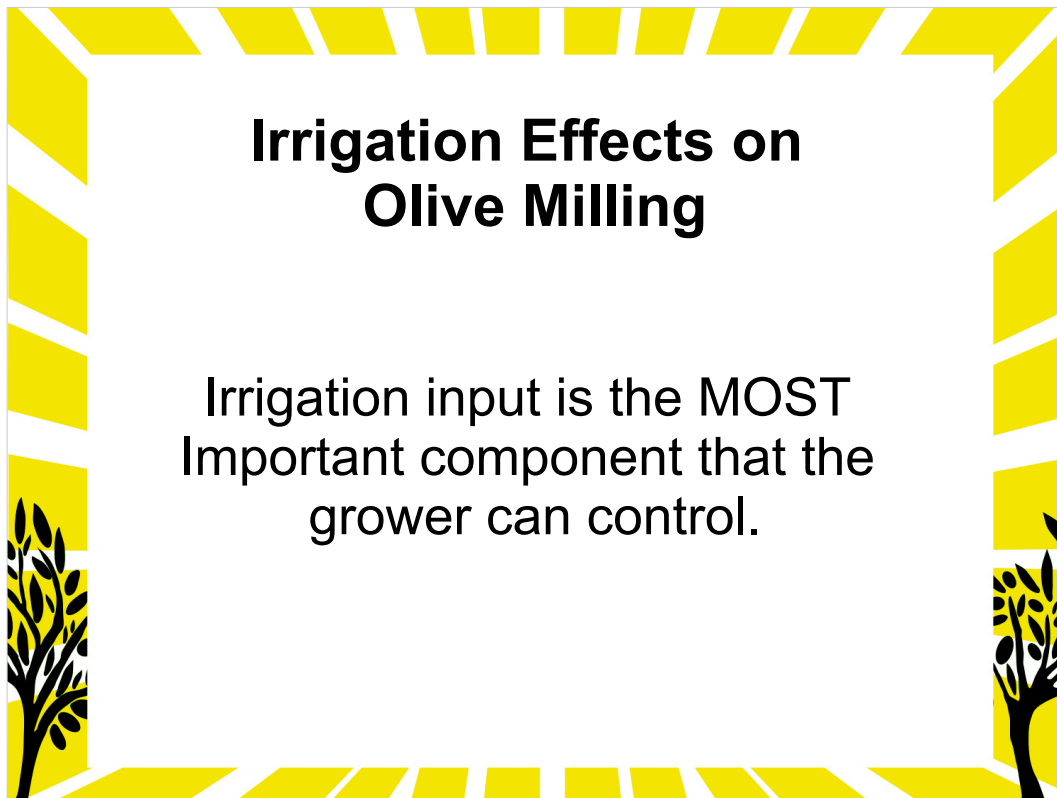


The Effects of Irrigation on Olive Milling





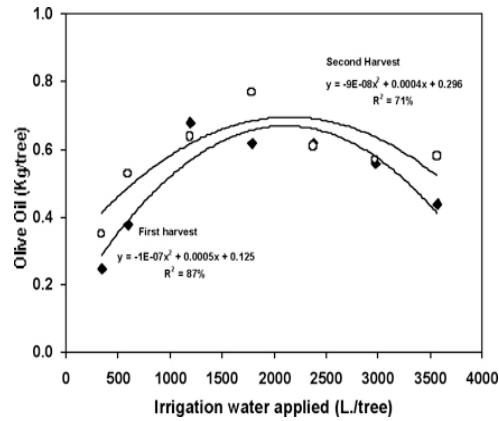
More important then:

Fertilizing

Varieties

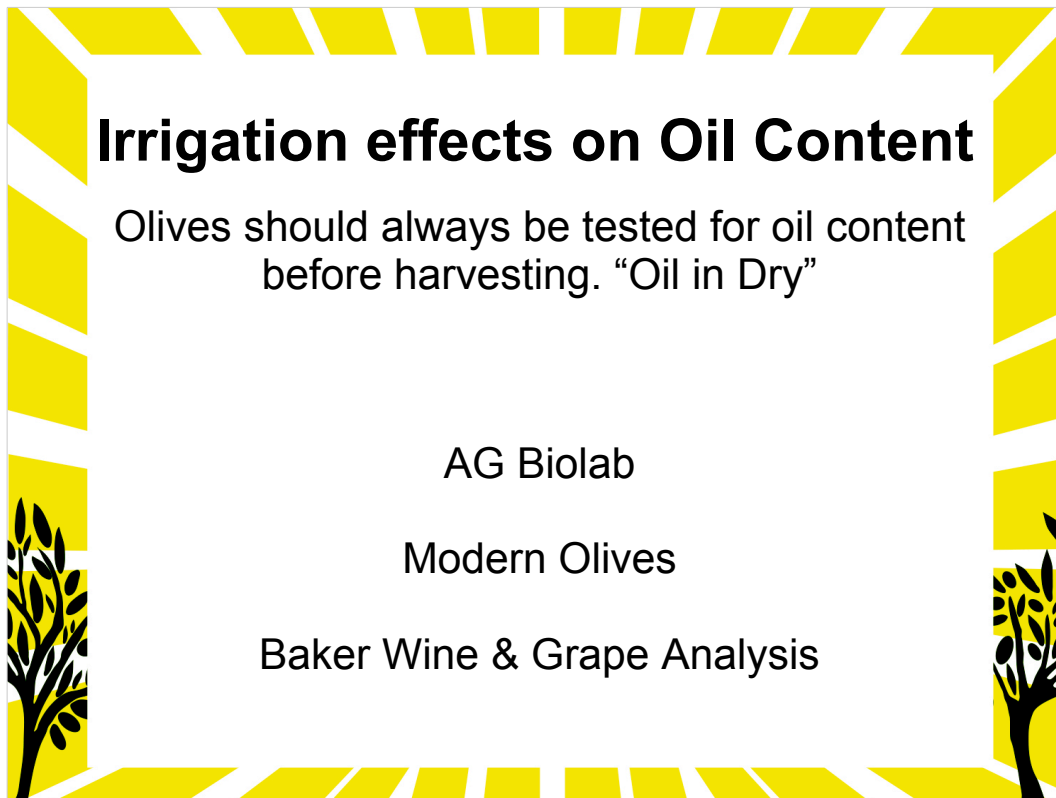
Type of harvesting

Irrigation Effects on Olive Milling



-Modern Olives/Boundry Bend

From Modern Olives in Australia not apples to apples with Texas but both share same Bell Curve shape.



The higher the water content the lower the oil content...
there is only so much room in an olive.

Oil content is not correlated to color/ripeness

Near Infra Red

Irrigation effects on Oil Content

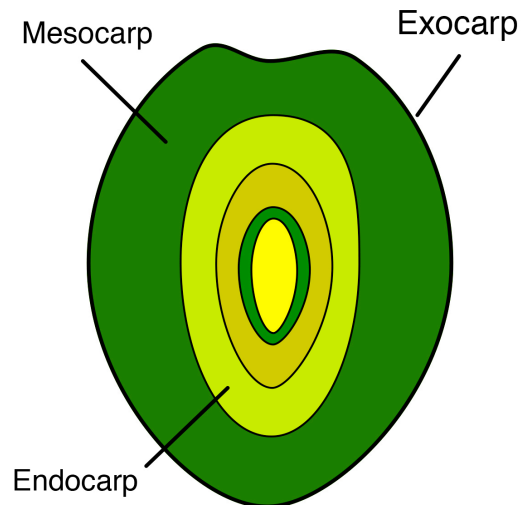
Olive milling is the process of separating the oil from the other fruit contents; vegetation tissue, water, & solid material.

-Wiesman Z.

Olive oil is produced in the mesocarp cells (Flesh) and almost all of it is stored in lipovacuoles

Lipovacuole is like a storage tank for oil that will breakdown with natural or artificial enzymes or through mechanical means, Milling

Irrigation effects on Oil Content



Mesocarp produces and stores the oil, “flesh” of the fruit.

Irrigation effects on Oil Content

The two main ways irrigation effects
Olive Milling are.

1. Efficiency of extraction at the Mill
2. Quality of the Oil





Emulsion: a fine dispersion of minute droplets of one liquid in another in which it is not soluble or miscible.

Oil has a much lower specific gravity than water. Creating an emulsion raises the oil's specific gravity by creating a colloid (butter, creams, and lotions) whose specific gravity is high enough to where the mill processes it as if it was water and it will go out with the wastewater reducing efficiency and wasting profits.

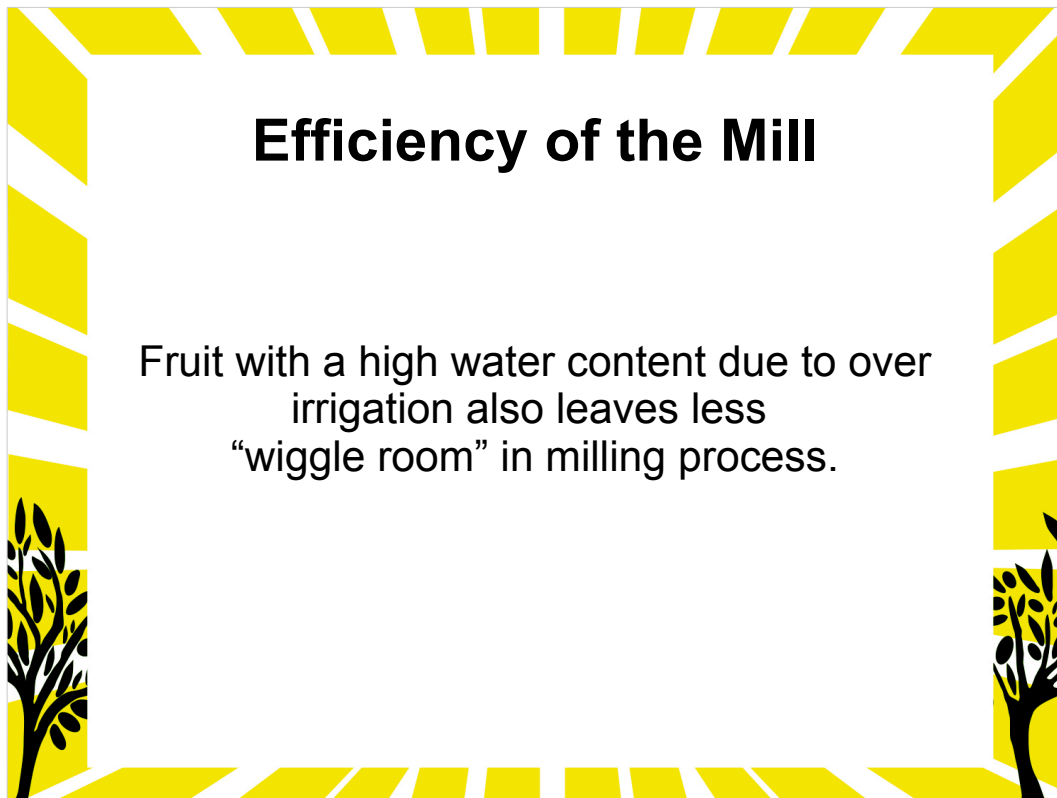
Free water content leads to emulsion and a drop in oil extraction.

Efficiency of the Mill

One reason water content is so important to the efficiency of the Mill is that the Washer, Decanter, and Separator work based on specific gravity.



Specific gravity: The ratio of the density of a substance to the density of a standard, usually water for a liquid or solid, and air for a gas



Can always add more water but you can't take it out without taking oil with it.



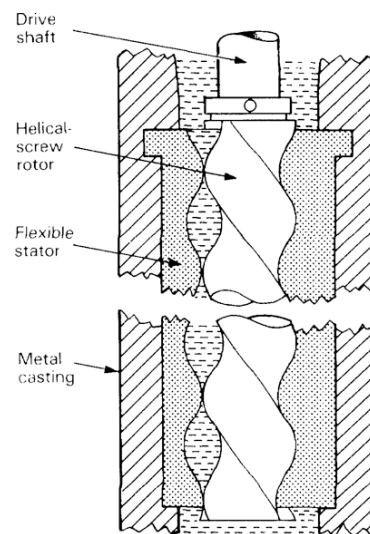
Efficiency of the Mill

High water content in fruit can lead to paste that is too “wet” lowering the effectiveness of the Malaxer and overworking paste transfer pumps to the point of failure.

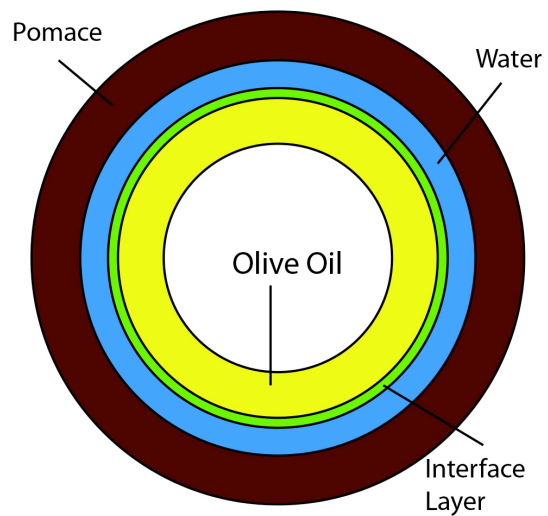
Paste transfer pumps are a type of Progressive Cavity Pump that are designed to move semisolids not liquids. Paste that is too wet will not flow properly through the pump and can cause the slower moving pit/stone fragments to be left behind between the worm screw and the stator.

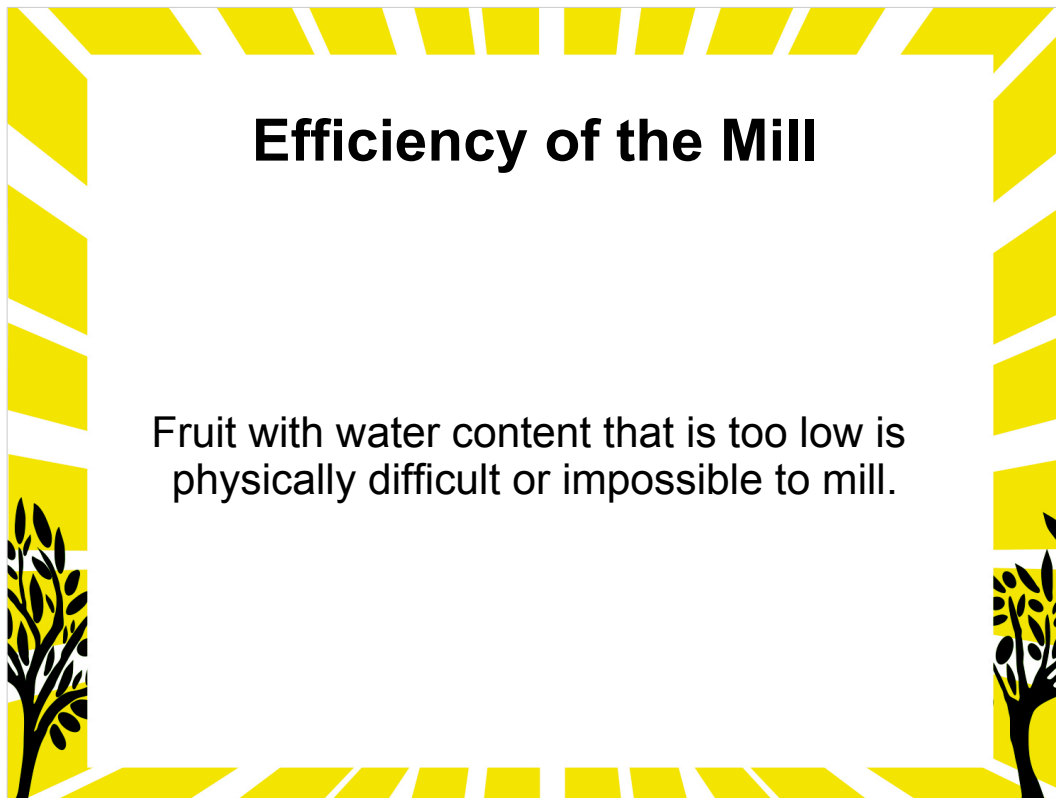
Paste with a high water content causes the equipment to reach capacity sooner increasing the time needed to fully process the fruit this increased time will lead to increased oxidation.

Efficiency of the Mill



Efficiency of the Mill





Will sink in the washer and not progress to the crusher.
Too difficult to crush. Overload Crusher.

Paste that is too dry will force pit/stone fragments into the stator generating heat from friction and damaging it by creating tears in the rubber.

Forcing the mill to shut down until the stator can be replaced.

Down time costs money.

Efficiency of The Mill





Total Polyphenol content is determined by irrigation which effects the maximum bitterness and pungency.

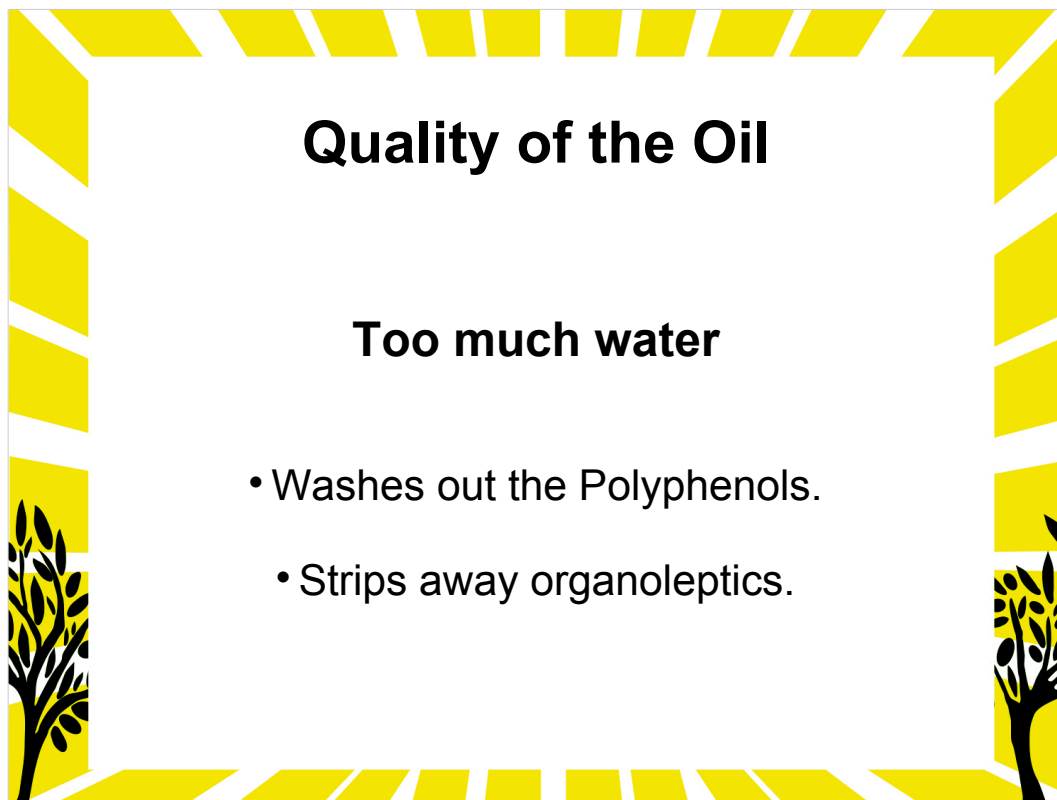


Quality of the Oil

Controlled stresses through adjusting
irrigation cycles increase
Polyphenol deposition in the fruit.

A lack of water causes vesicles to contract starting from the tips of the branches heading toward the trunk.

When watering resumes the vesicles open back up and carry water that includes polyphenols from the plant to get deposited in the fruit (drupes)

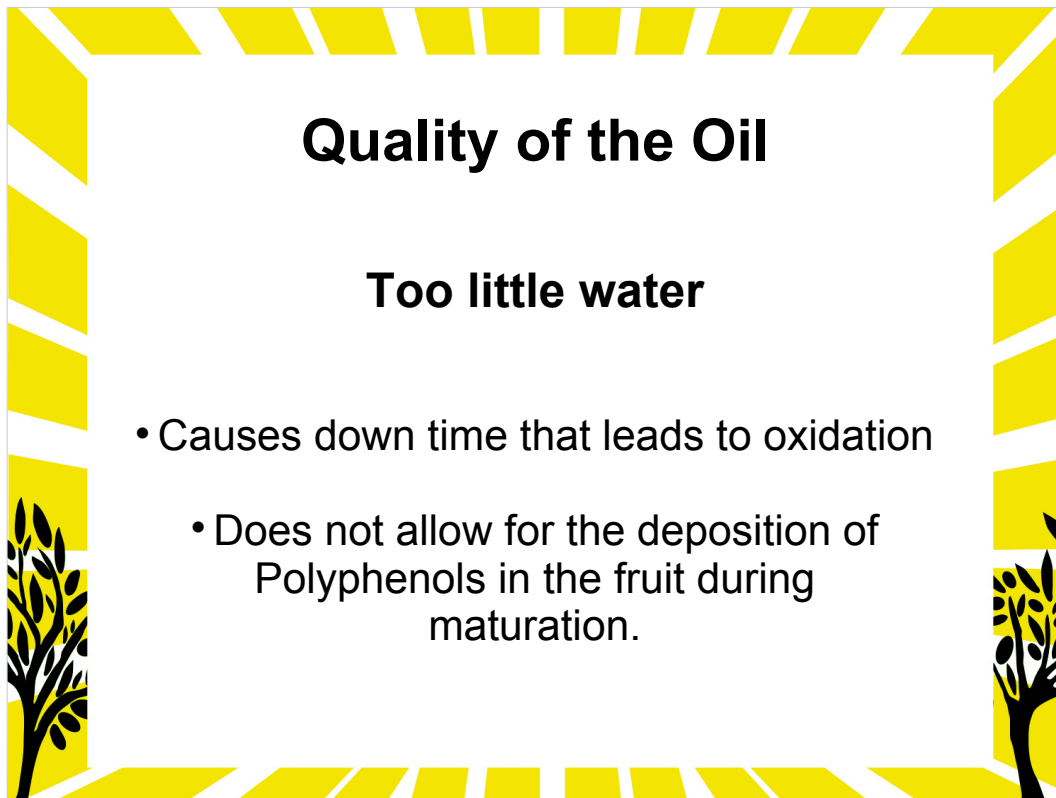


Excess water in the mill due to over irrigated olives will carry beneficial components that define EVOO out with the waste water.

Polyphenols are antioxidants they protects olive oil itself from oxidation “Coats of paint on iron”.

There is a dramatic decrease in quality once all of the polyphenols are consumed.

Color pigments will also be stripped out
Chlorophyll (Green) in early harvest olives and
Carotenoids (yellow) in late harvest olives.



Delays at the crusher, replacement of stators, and clogs in the separator lead to a back log of paste and fresh olives in the production time.

Any increase in time leads to oxidation especially after the olives have been crushed into paste.

Oxidation leads to increased PV levels that will dramatically shorten shelf life and easily push oil out of spec to be EVOO



OMW is phytotoxic. -Wiesman, UC Davis

Phytotoxic: A compound that has a toxic effect on plant growth.