Orchard Management

OPTIMIZING PROFITABILITY FOR EXISTING GROVES

BOUNDARY BEND
OLIVES

CŌBRAM ESTATE

Keys to Optimizing Grove Profitability

1) Number of Olives per Acre

X

2) Average Size of Fruit

X

3) Oil Content % of Fruit

X

4) Harvesting Efficiency

X

5) Processing Extraction Efficiency

=

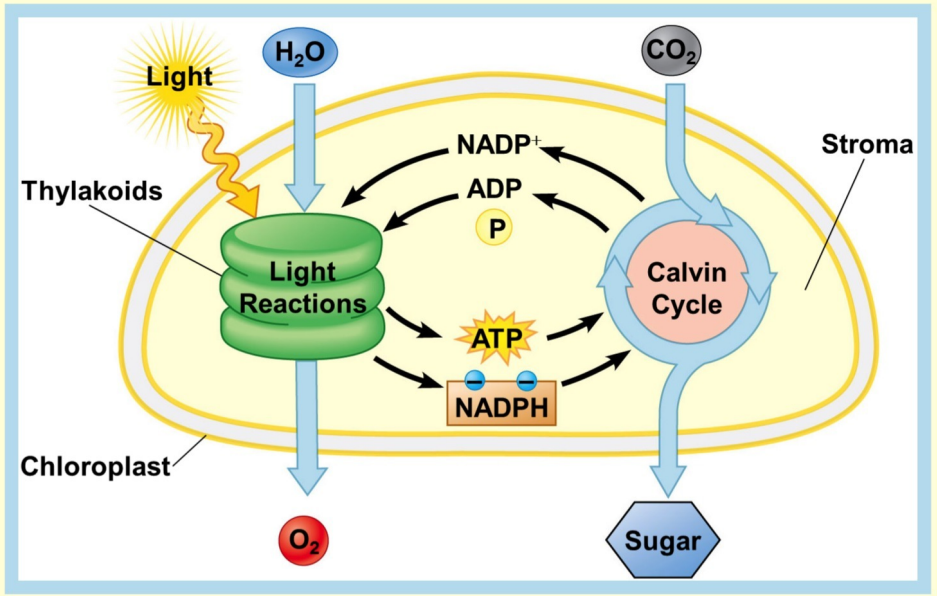
Per Acre Oil Yield

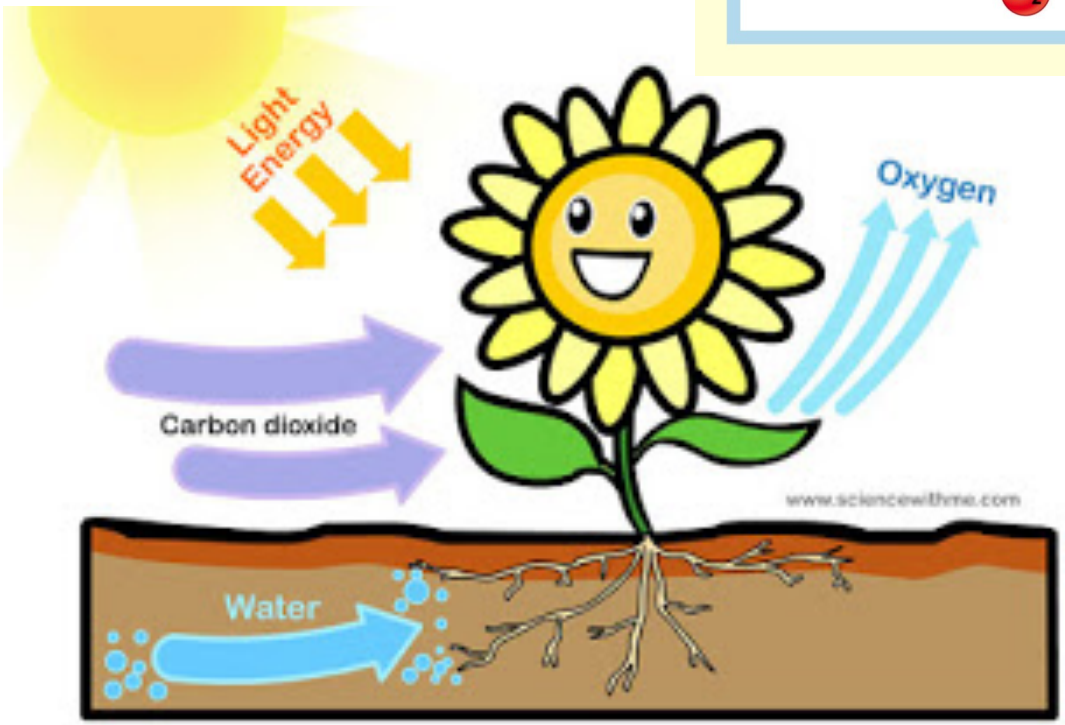
Grove Irrigation

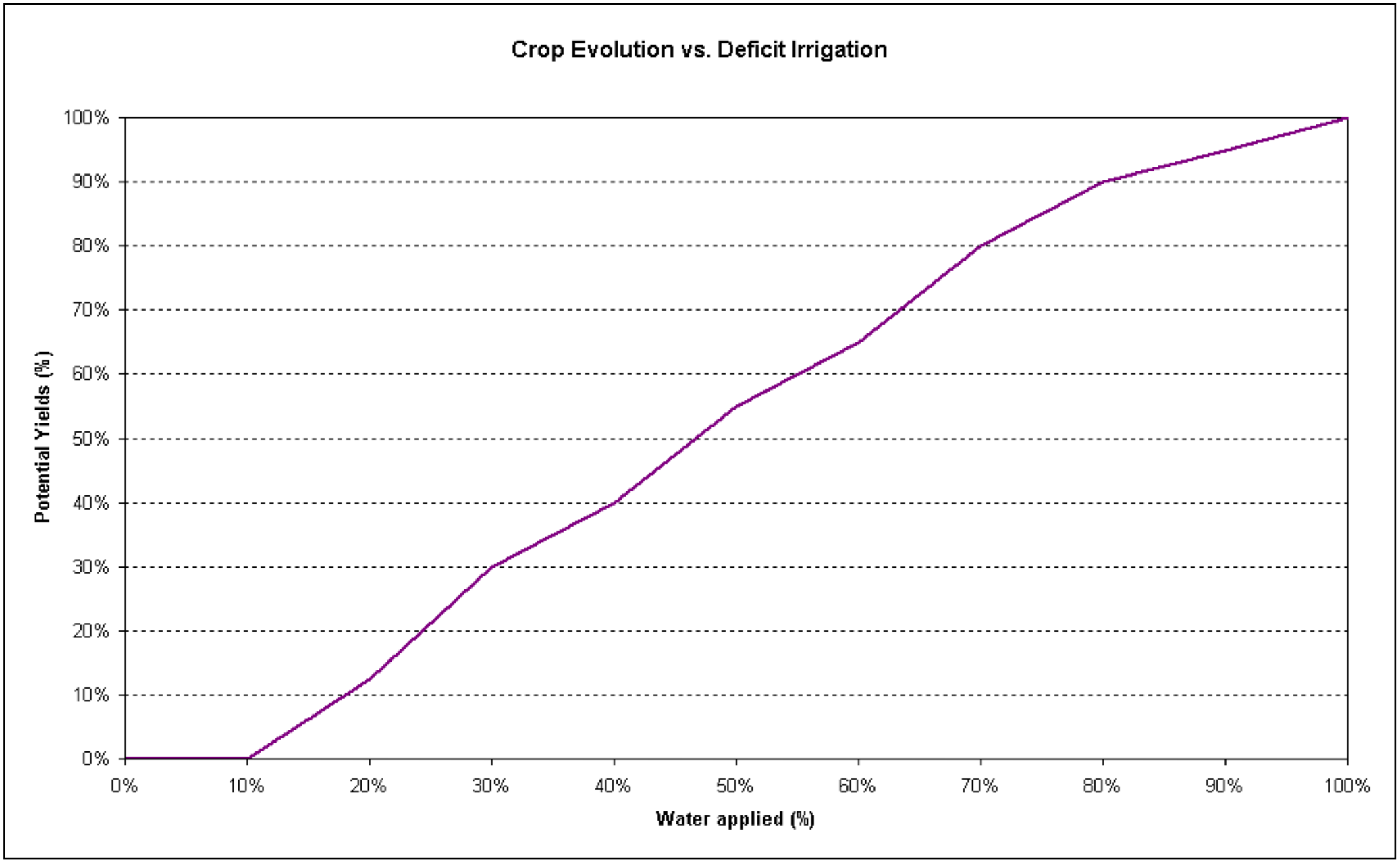
Why Irrigate?

Irrigation is a critical component in photosynthesis

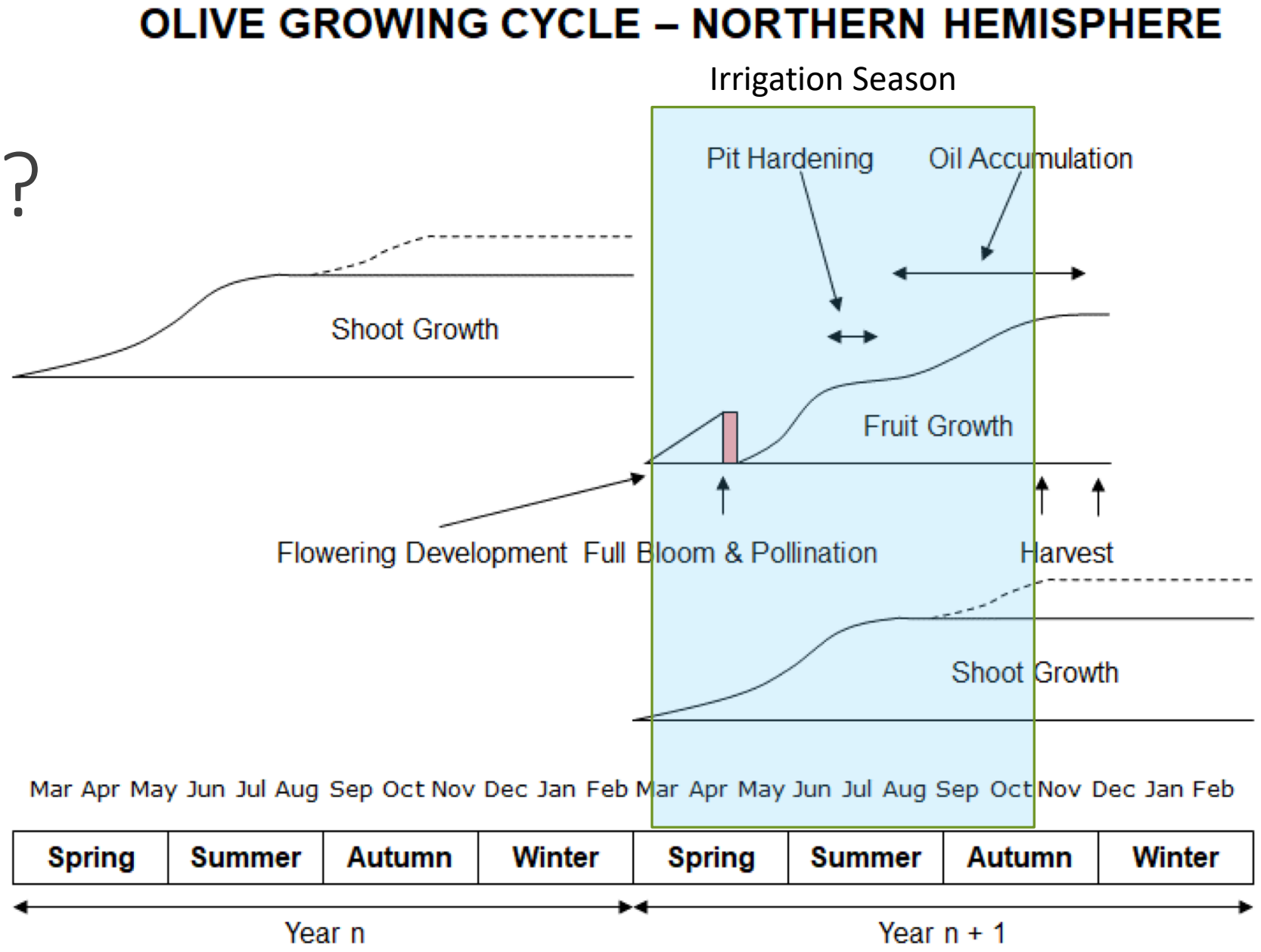
Photosynthesis drives shoot & root growth and fruit development



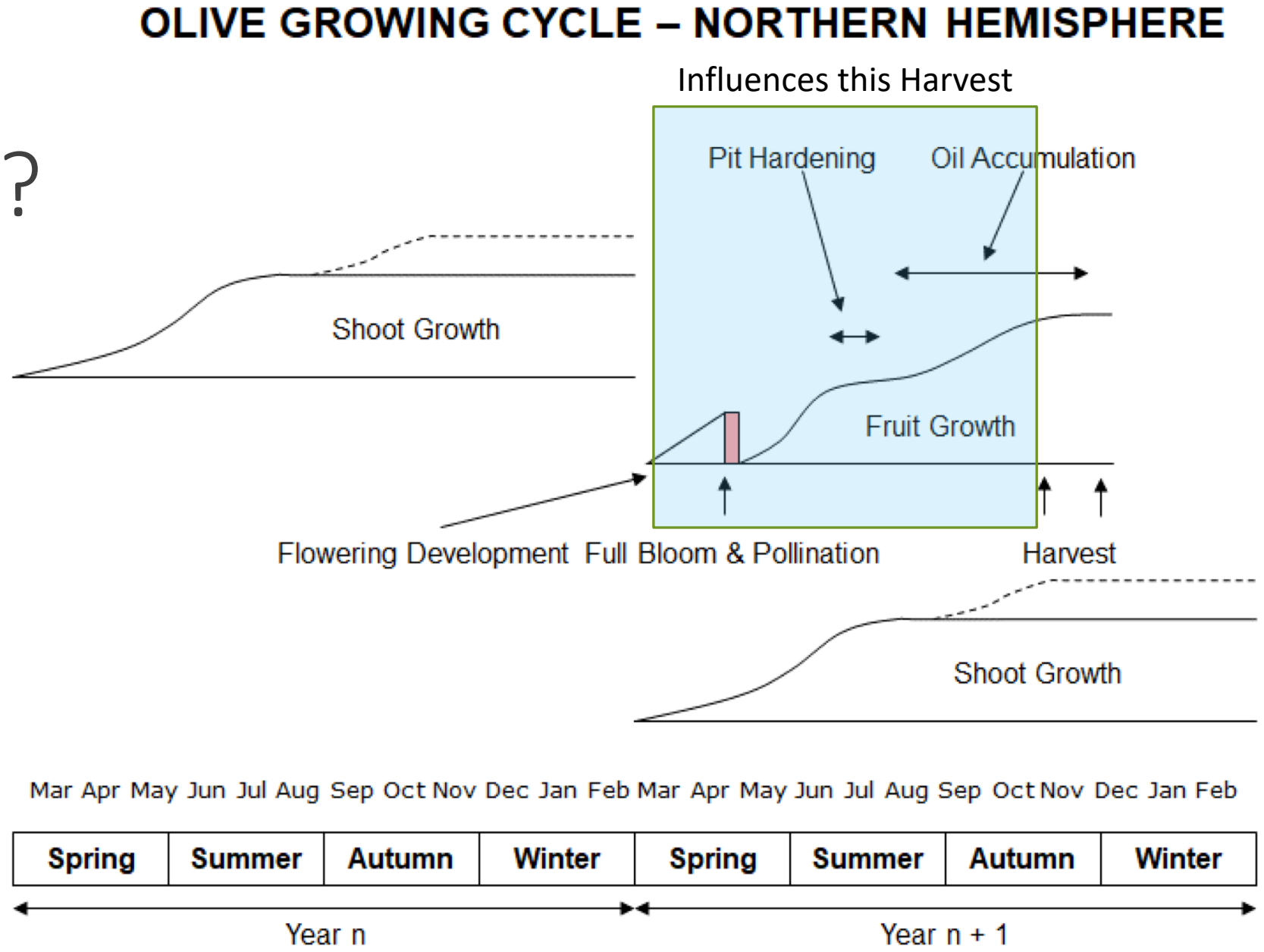



Crop Evolution vs. Deficit Irrigation
Potential Yields (%)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Water applied (%)

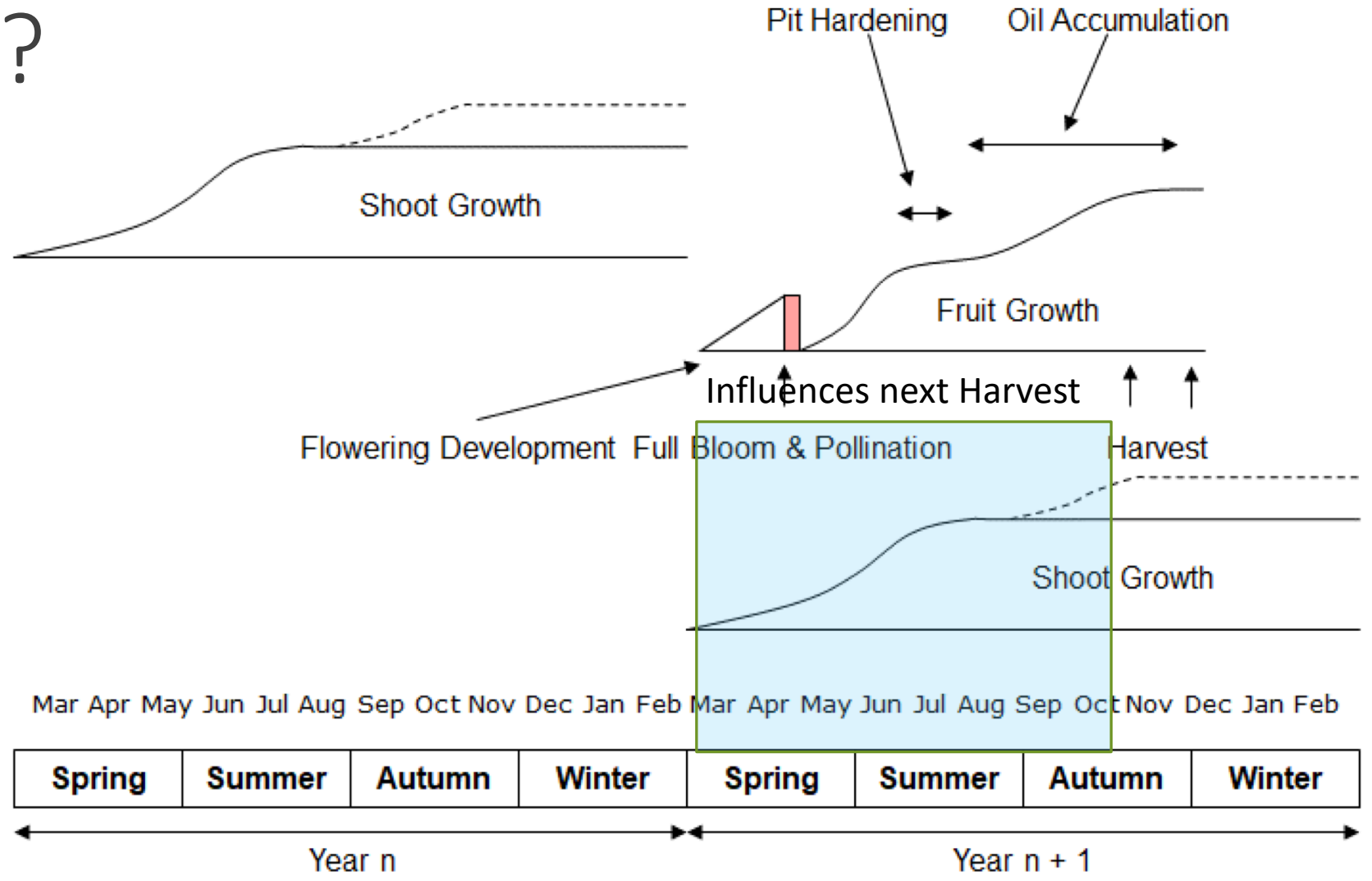
When to Irrigate?



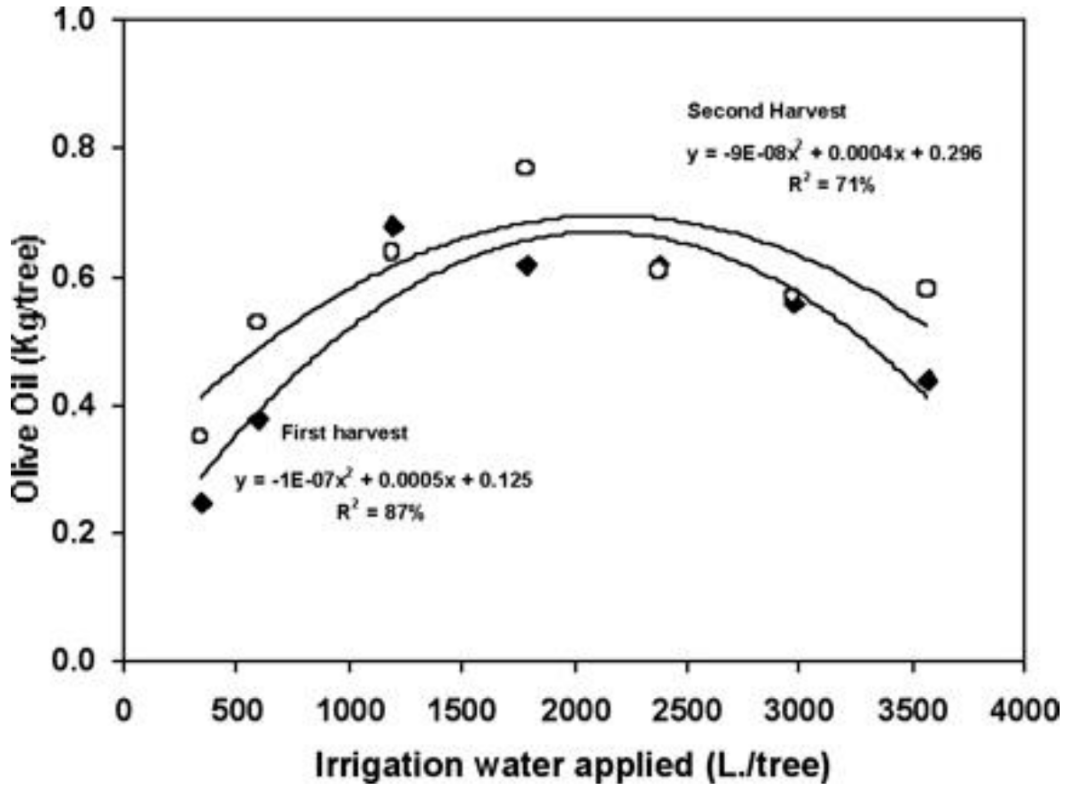
When to Irrigate?



When to Irrigate?



How much to Irrigate?

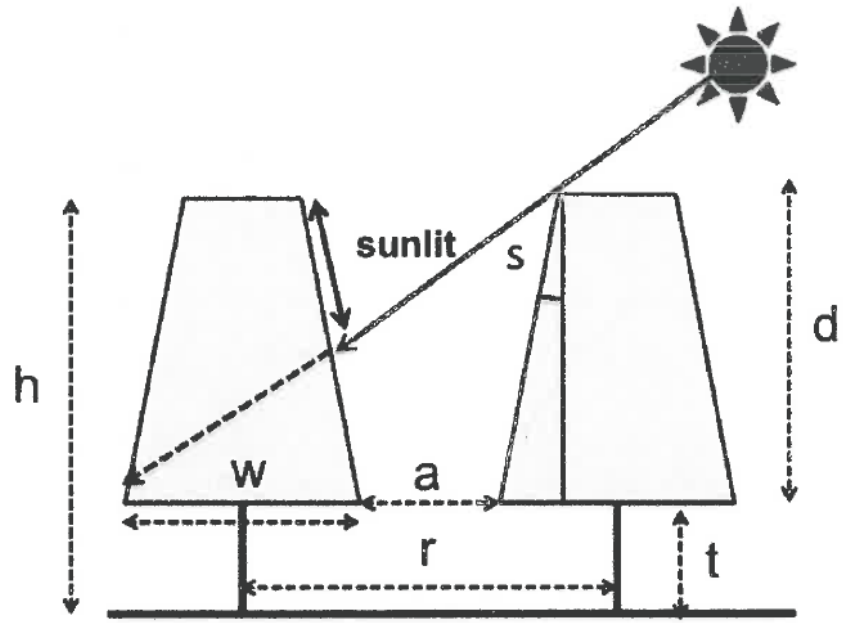


Source: Olive oil production as influenced by different quantities of applied water; Agricultural Water Management, Volume 85, Issue 1, Pages 133-140; S.R. Grattan, M.J. Berenguer, J.H. Connell, V.S. Polito, P.M. Vossen

How much to Irrigate?

Irrigation Requirements = ETo X Kc X Kr X I.E. – E.R.

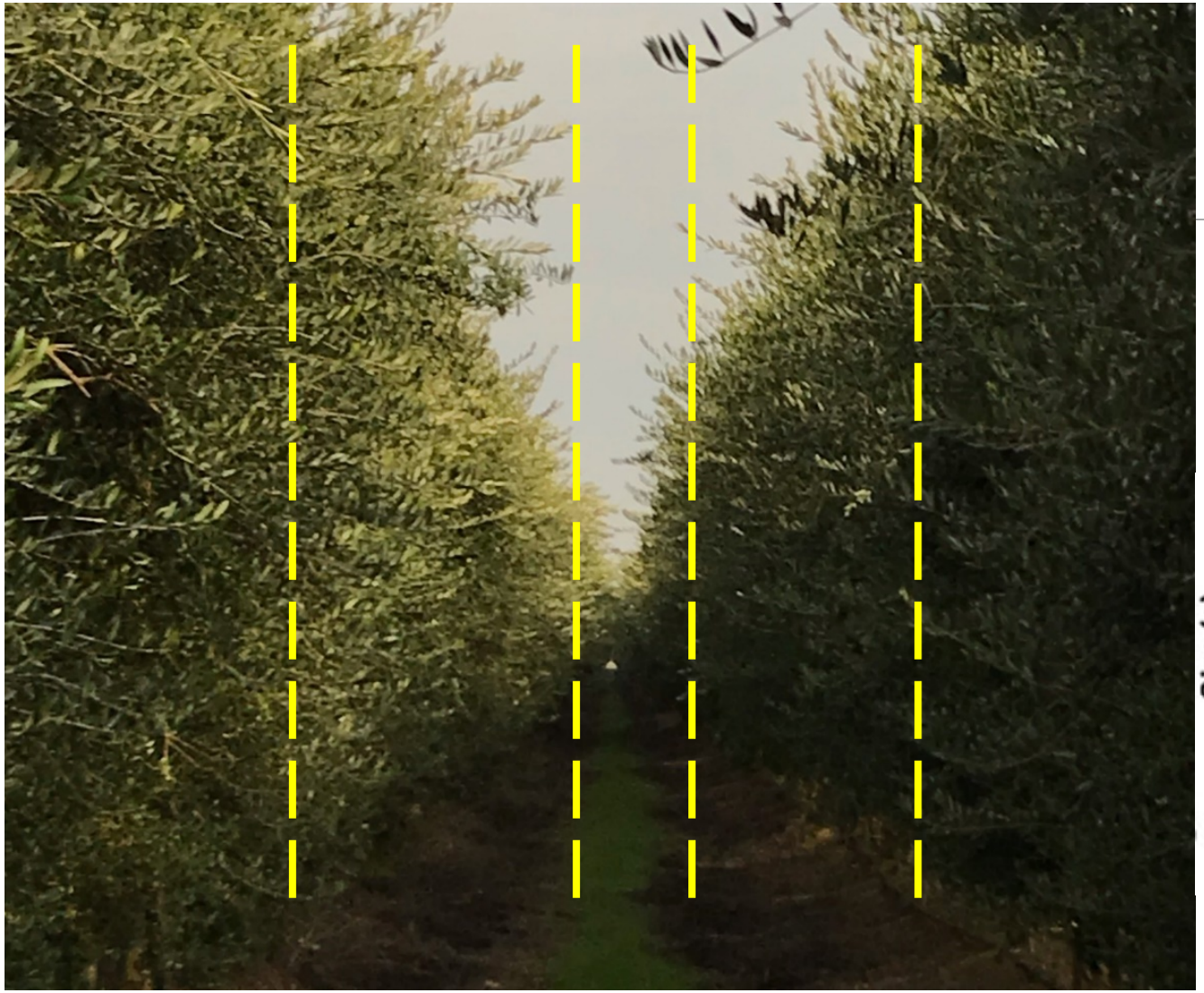
ETo:	Reference evapotranspiration
Kc:	Crop factor
Kr:	Tree size factor
I.S.E.	Irrigation system efficiency
E.R.:	Effective rainfall



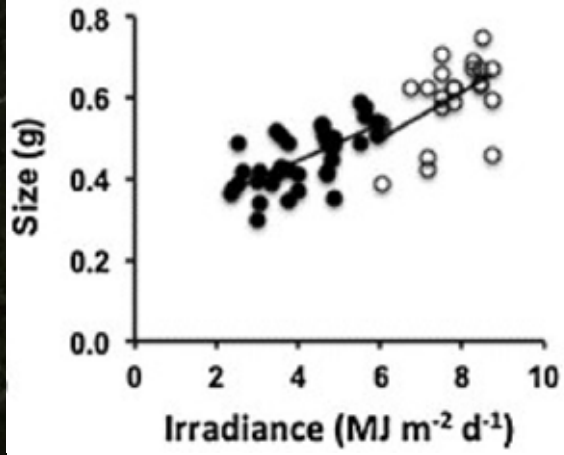
Canopy Management

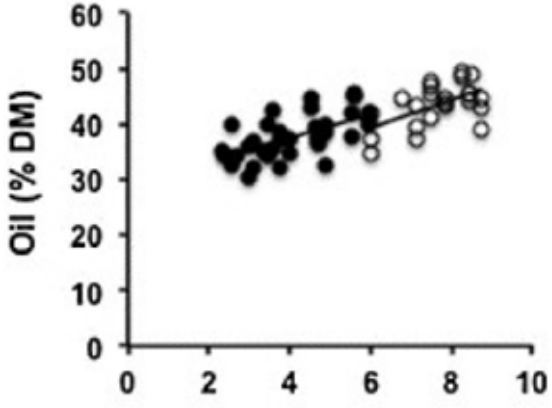
"He who ploughs the olive grove, asks it for fruit; he who fertilizes it, demands fruit; he who prunes it, forces fruit out of it."

- Lucio J.M. Columela, 3 B.C.



2.0 gr/fruit 1.4 gr/fruit 0.9 gr/fruit



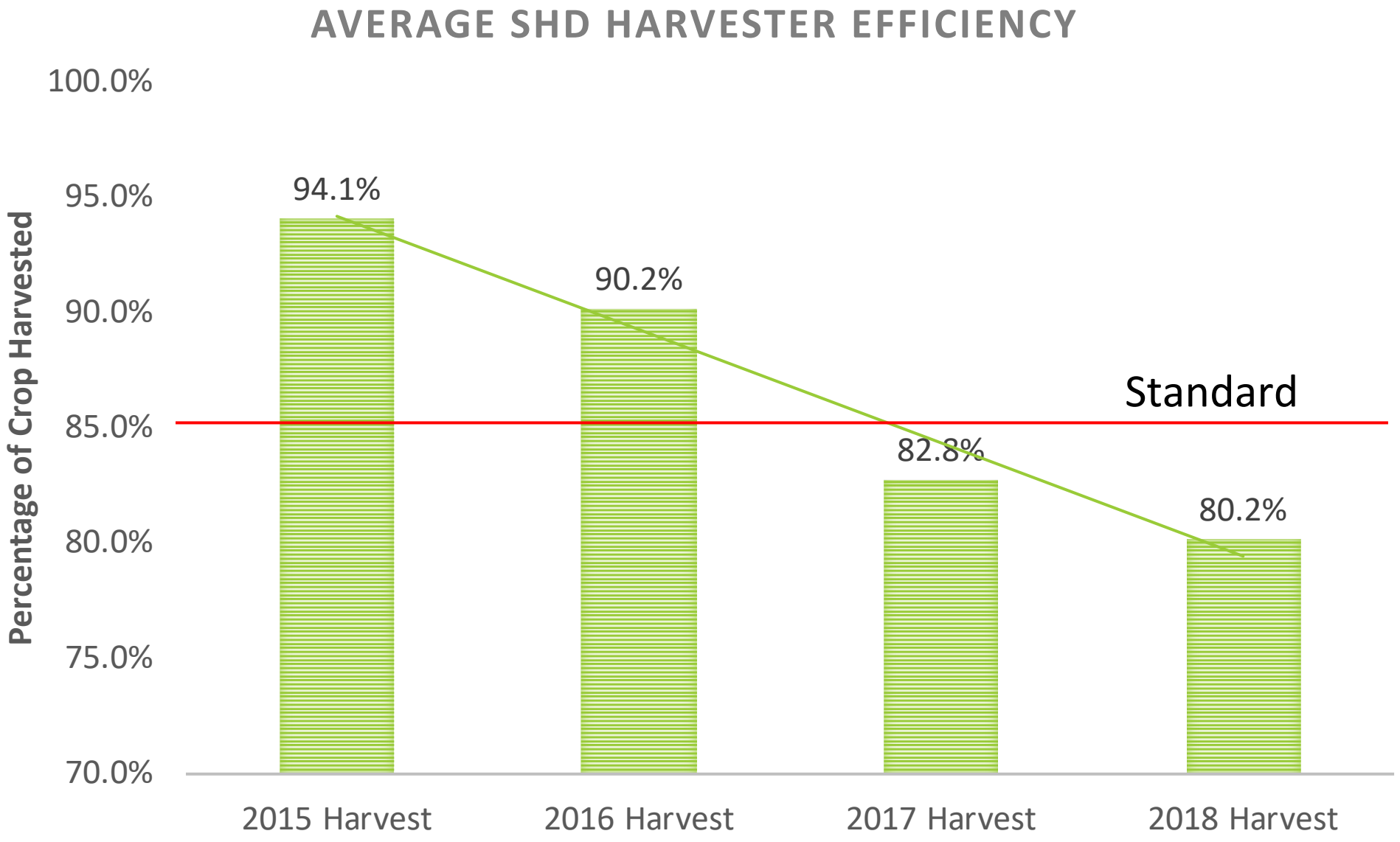


Connor: Structure, management and productivity of hedgerow olive orchards: A review Volume 1, Issue 1, Page 77; Connor and Gomez-del-Campo, 2013

Scenario 1 VS Scenario 2

Variety	Scenario 1 Arbequina	Scenario 2 Arbequina	Difference
Oil Content of Fruit:	19.5%	17.0%	-2.5%
Fruit density	450 fruit/m2	450 fruit/m2	0 fruit/m2
Fruit size	1.4 g/fruit	1.8 g/fruit	0.4 g/fruit
Oil in Fruit:	0.27 g of oil in fruit	0.31 g of oil in fruit	0.03 g of oil in fruit
Oil production per m2	172 g of oil per m2	248 g of oil per m2	76 g of oil per m2
Canopy surface per Acre	5171 m2	5171 m2	0 m2
Oil Production per Acre	258 gal	372 gal	114 gal
Net Production Per Acre (85% H.E, 85% E.E.)	186 gal	269 gal	82 gal

Harvesting Efficiency


AVERAGE SHD HARVESTER EFFICIENCY
Percentage of Crop Harvested
100.0%
95.0%
90.0%
85.0%
80.0%
75.0%
70.0%
94.1%
90.2%
82.8%
80.2%
Standard
2015 Harvest
2016 Harvest
2017 Harvest
2018 Harvest

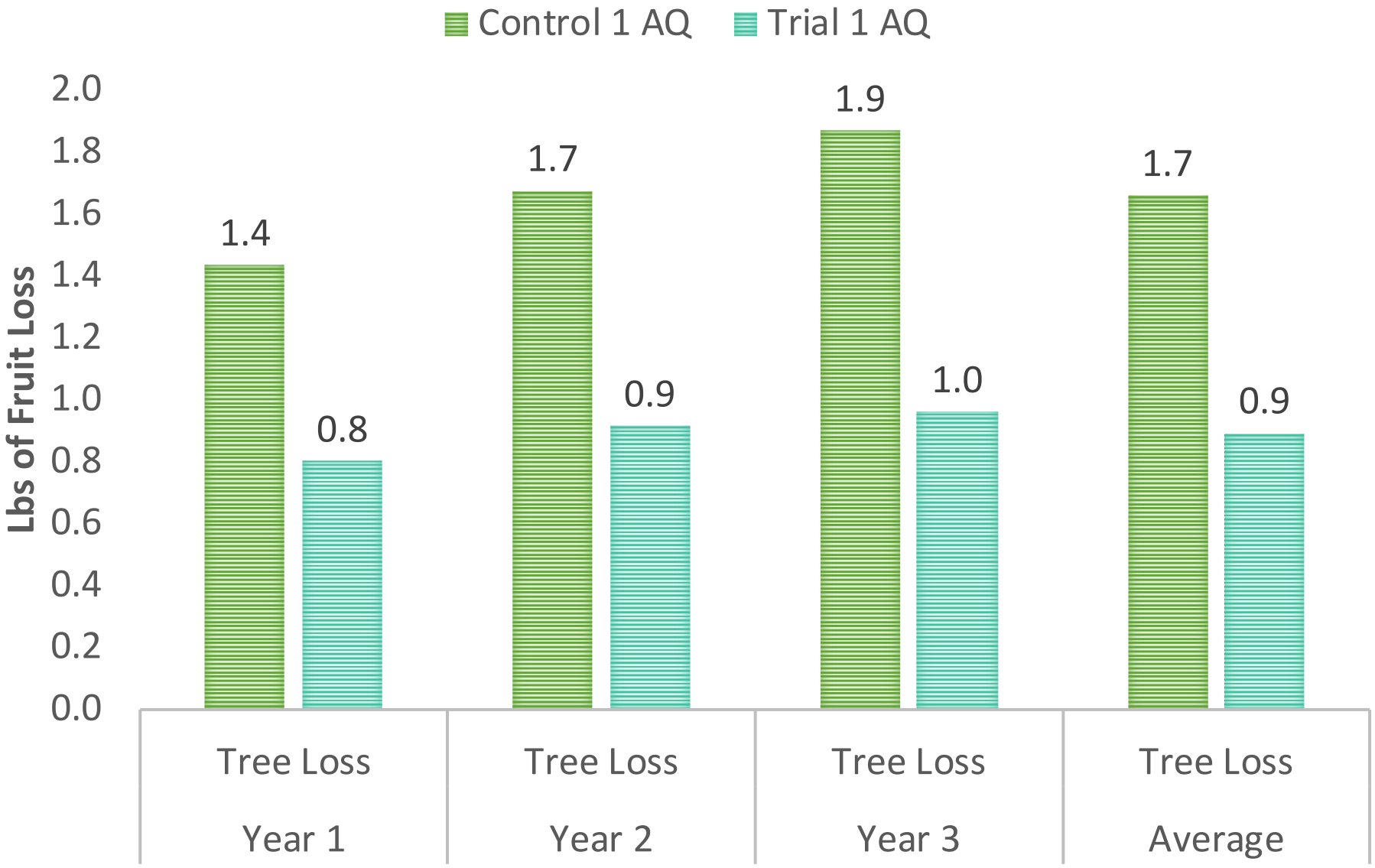
Mummies

- 1.0% mummies (FFA @ 40%) = 0.40% + 0.19% = 0.59%

- Not all mummies are equal (anthracnose).

  0.5% mummies (FFA @ 90%) = 0.45% + 0.19% = 0.64%

HAND PRUNING VS HEDGING (TRIAL)



Economic assessment:

Tree loss difference = **0.8 lbs/tree**

0.8 lbs/tree X 670 trees/ac = **536lbs**

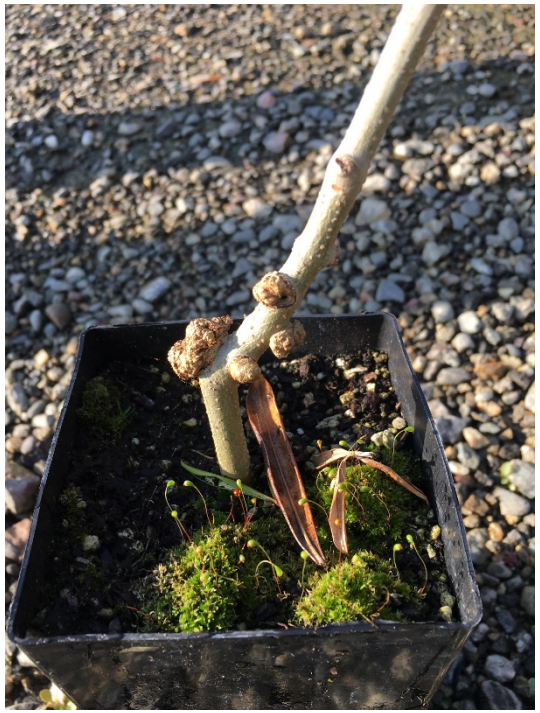
536 lbs/2000 lbs = **.27 tn/ac**

.27 tn/ac X 40 gal/tn = **11 gal/ac**

11 gal/ac X $20/gal = **$220/acre**

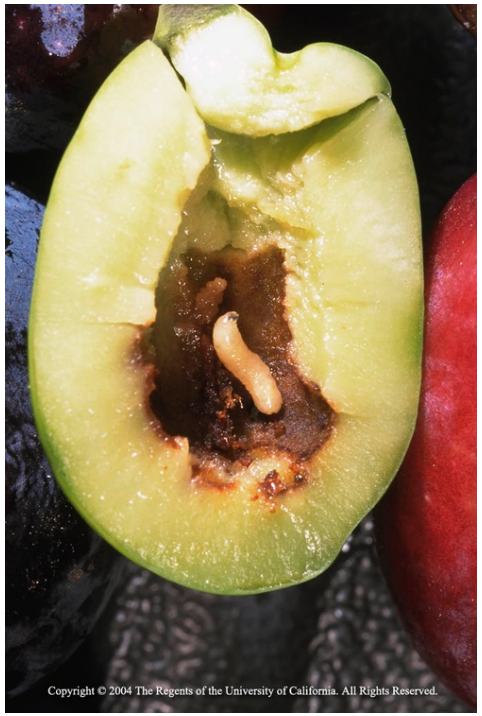
Pest & Disease

Olive Knot (*Pseudomonas savastanoi)*




- Most impactful disease effecting olives in CA
- Bacterial disease
- Primarily transmitted by water to open wounds
- http://www.oliveoilcommission.org/research/

Olive Fruit Fly (*Bactrocera oleae)*



- Flies implant egg into olive
- Larva/Pupa feed on olive flesh
- Flies exit olive and leave exposed wound
- Disease and fungus enters into exposed olive
- www.ipm.ucanr.edu/

Remember this!

- Irrigation impacts nearly every factor that effects grove profitability
- When you irrigate, you irrigate this year and next year's crop
- Canopy management is critical for ensuring optimal fruit development and long term cropping
- Sub-par harvesting efficiency can create problematic mummy conditions and reduce the following year's crop
- Be careful with sanitation and fungicide applications in controlling olive knot. You'll thank yourself later.
- Fruit fly damage can decimate the quality of your entire orchard. Monitor and control it!

Last thing…

1) Number of Olives per Acre

X

2) Average Size of Fruit

X

3) Oil Content % of Fruit

X

4) Harvesting Efficiency

X

5) Processing Extraction Efficiency

=

Per Acre Oil Yield

Thank you!