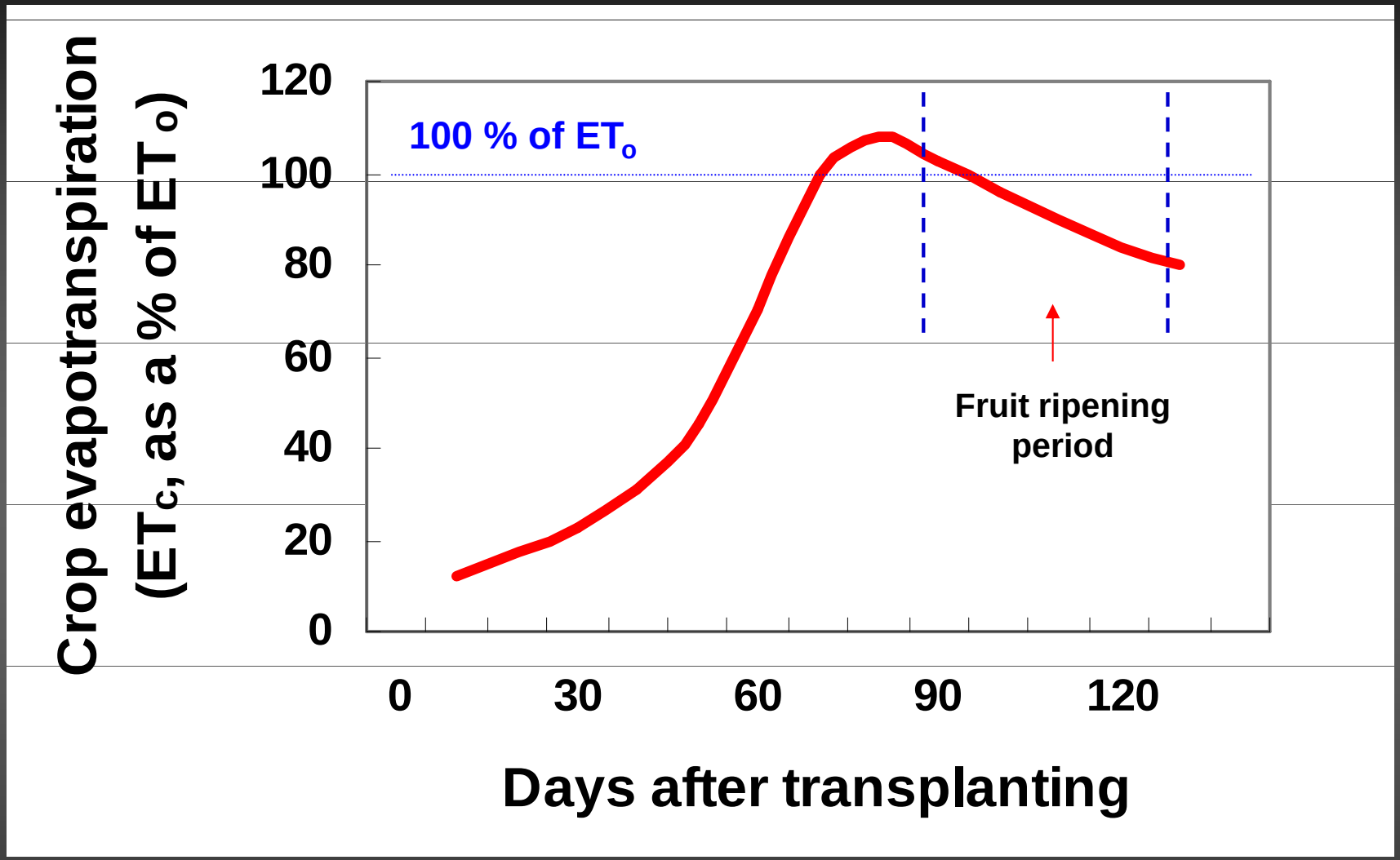

Deficit irrigation for soluble solids management

How do tomato fruit respond to irrigation ?

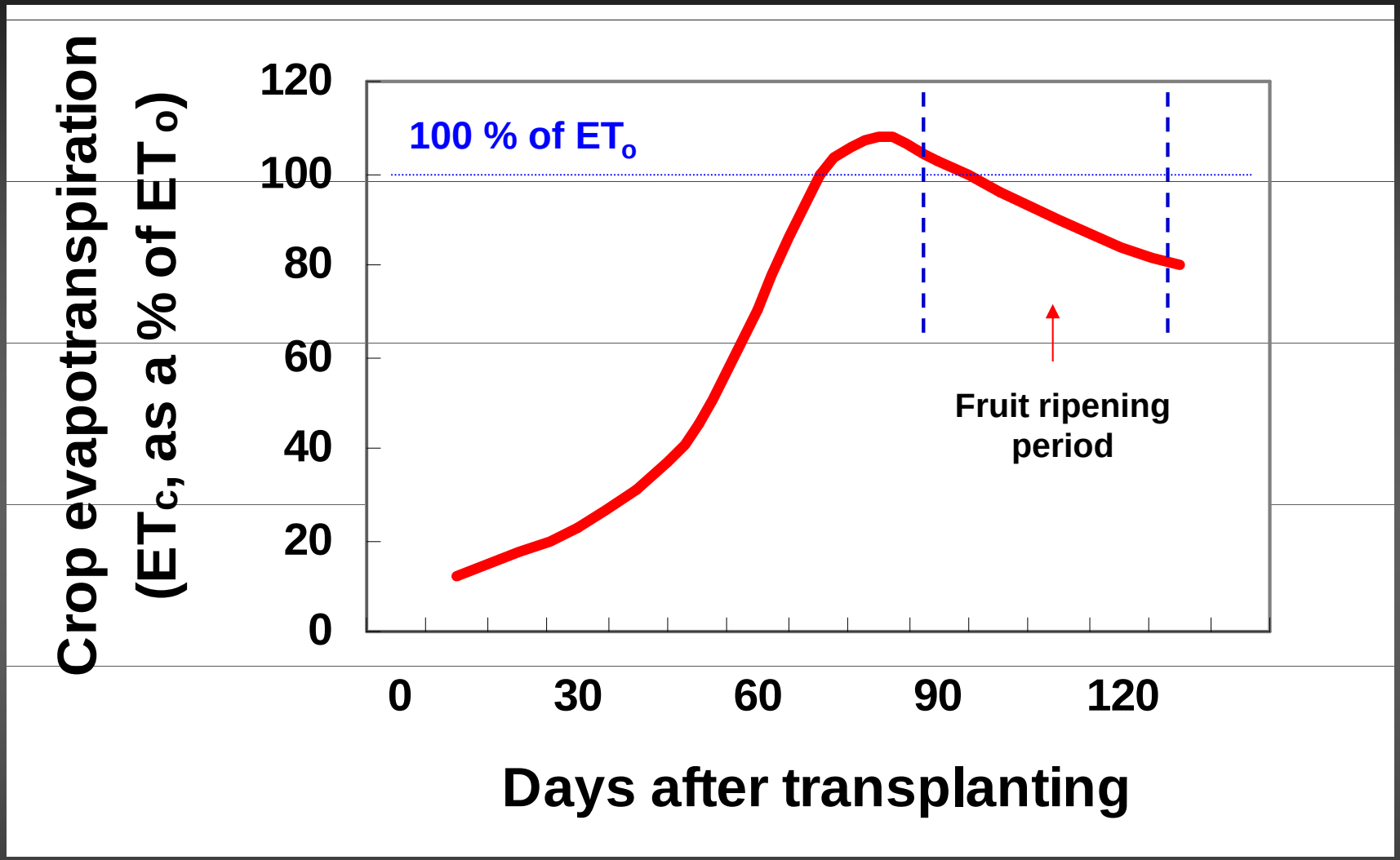
- Water content of green fruit changes with plant water status, so irrigation management affects soluble solids concentration of green fruit

- Water content of red fruit is not affected by subsequent changes in plant water status, so irrigation management has no effect on soluble solids concentration of ripe fruit

As plants mature, transpiration is reduced :



To increase solids, reduce irrigation during fruit ripening :



General guideline:

- **apply 30 – 70% of ET_o starting at early fruit ripening**
  - **use greater reduction with high water holding soil**

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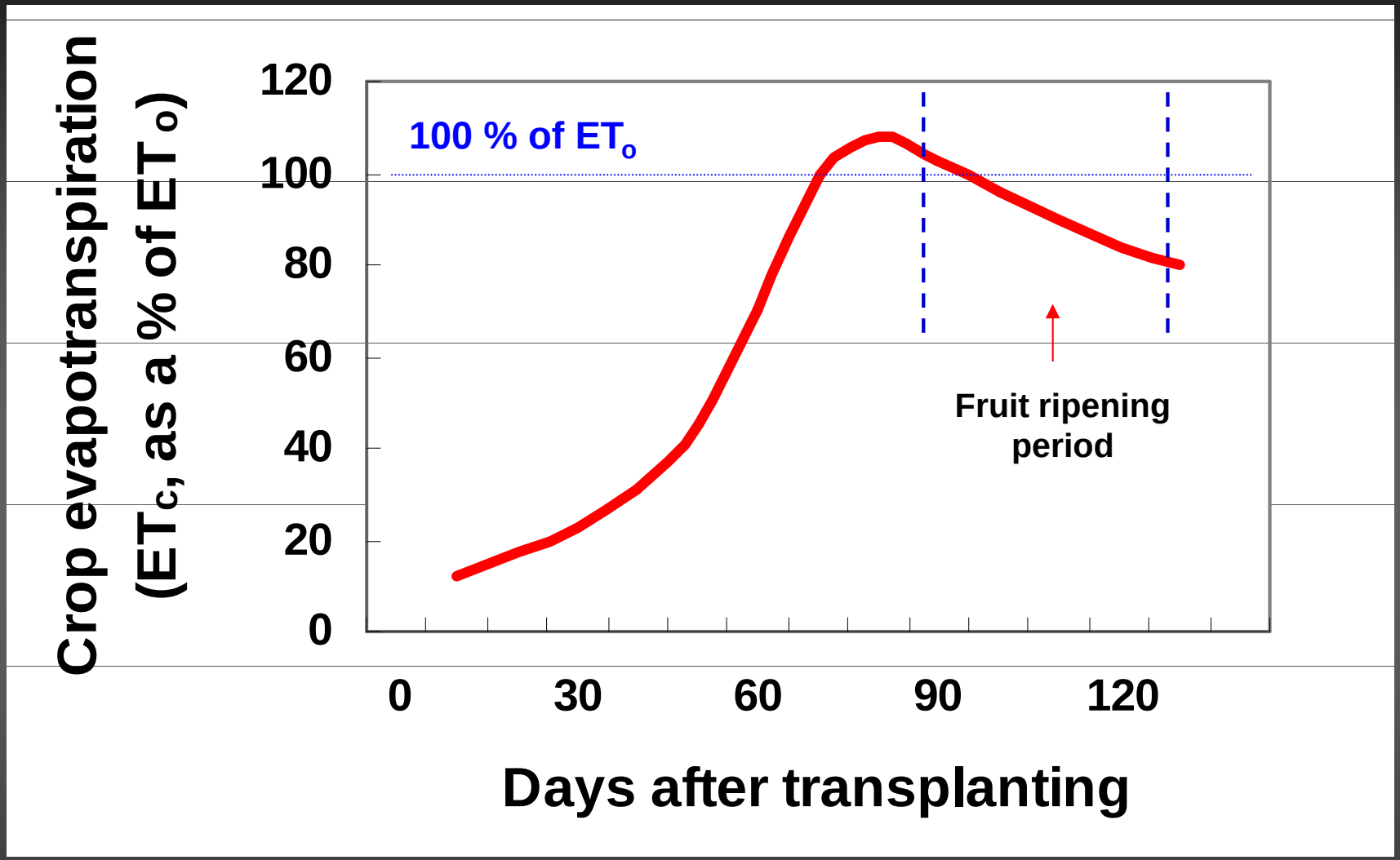


Why not just use an irrigation cutoff ?

- **A higher percentage of fruit will be red before an effective level of stress is reached**

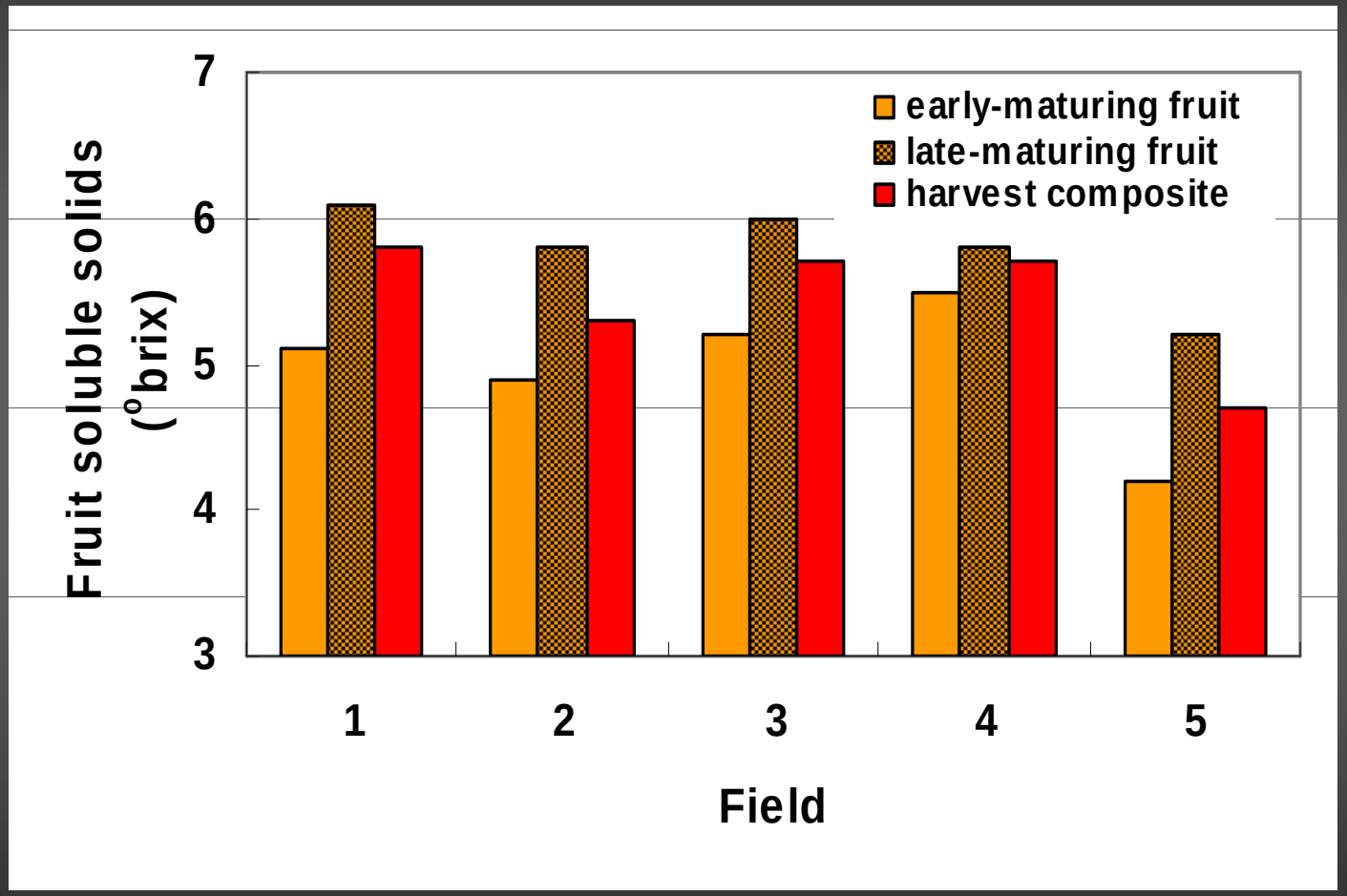
How can you tell if your deficit strategy is working ?

- **Monitor soil moisture**
  - **significant brix increase unlikely until the top two feet of soil reaches > 30 centibars**

It may take a week or more of deficit irrigation to reach that level of stress

How much can you increase brix by deficit irrigation ?

2003-04 commercial field trials :



Deficit irrigation during fruit ripening can increase overall soluble solids concentration by 0.3 - 0.5 °brix

Will late-season deficit irrigation hurt yield ?
Can deficit irrigation be profitable for a grower?

- ✓ Fresh fruit yield will be reduced
- ✓ If done correctly brix yield (tons of solids) will *not* be reduced

Example:

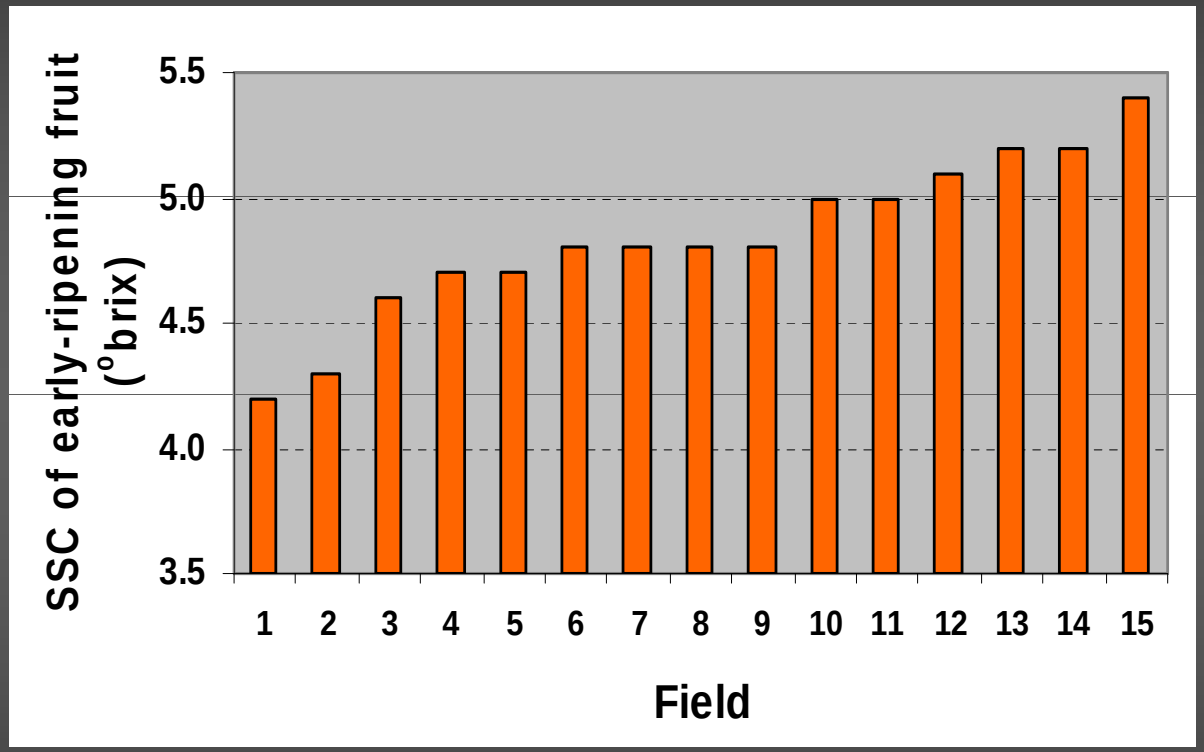
Yield with full irrigation = 50 tons @ 4.7 brix = 2.35 tons of solids

2.35 tons of solids @ 5.0 brix = 47 tons yield

- ✓ On average about 2 inches of water can be saved by a late-season deficit irrigation strategy

Deficit irrigation more important in some fields that others :

- test early-ripening fruit to see how much brix increase is needed



Test a composite sample of at least 20 fruit:

- ✓ From different plants throughout the field
- ✓ Showing some external color change
- ✓ No damage or blossom end rot