



UNDERSTANDING FROST SUSCEPTIBILITY ACROSS CITRUS VARIETIES

CHALLENGING FRUIT

- Wide temperature tolerance across varieties
- Changing frost hardiness throughout the year
- No single factor gives the answer





FACTORS THAT AFFECT FROST HARDINESS

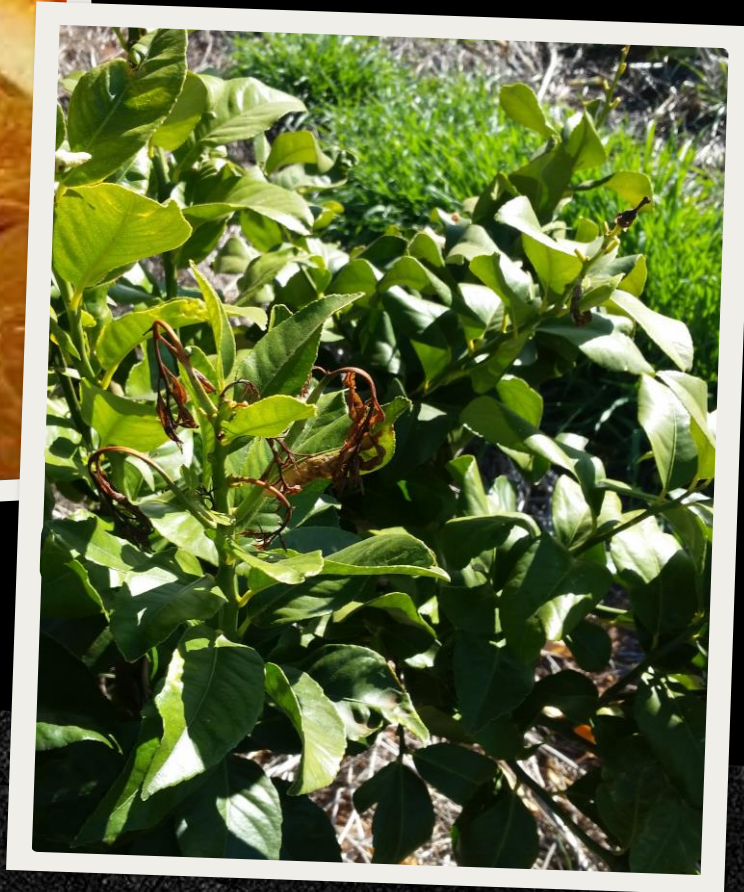
- Sugar content
- Size fruit
- Skin thickness
- Water and Solutes
- Timing
- Physical features



SUGAR CONTENT

- Natural Cryoprotectant
- Lowers freezing point of water
- Increases hardiness





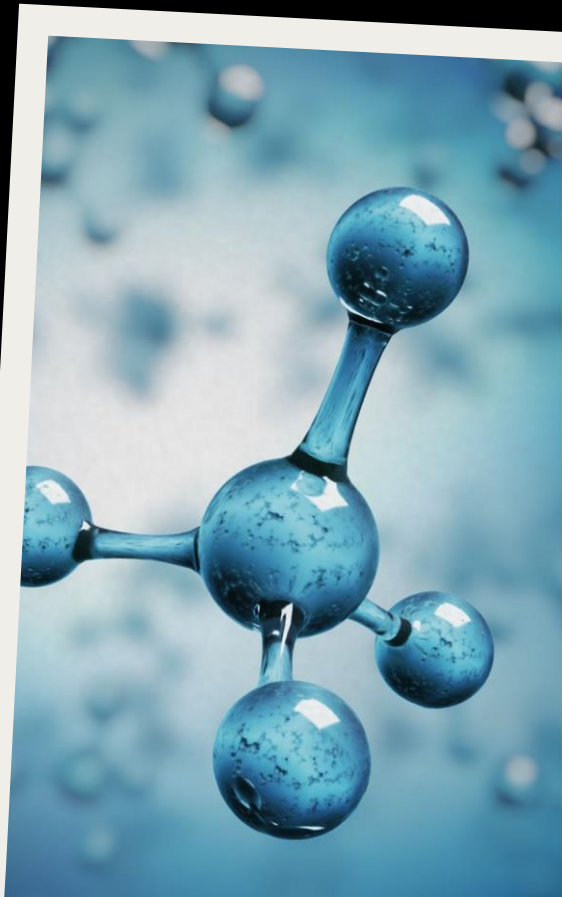
SIZE AND SKIN

- Large fruit takes longer to freeze
- Thick skin retards radiation heat losses



WATER AND SOLUTES

- Pure water freezes at zero degrees C
- Solute concentration lowers freezing point of water
- Solute concentrations changing throughout the year
- A significant influence on frost hardness





TIMING

- Frost hardiness changes throughout the year
- Sensitivity can vary across the growing period
- Mature fruit more resilient than immature fruit



PHYSICAL CHARACTERISTICS

- Well developed canopies
- Thick, waxy leaves
- Thick fruit skin

WHAT CAN YOU DO?

- Understand variety affects frost tolerance
- Research your plant characteristics
- Learn your regional and orchard climate
- Combine data and apply

