Physiological Effect of Summer Pruning in Apple Trees

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Summer Pruning

- Control tree size
- Improve fruit color
- Smaller fruit size
- Lower final yield
- Inferior fruit quality
Summer Pruning

Fruit growth
Final size

Carbohydrate Supply

Fruit Demand
Summer Pruning

Carbohydrate Supply

Fruit growth
Final size

Fruit Demand
Summer Pruning

Carbohydrate Supply

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Empire/M.9

Slender spindle

22-year-old

5’ x 11’
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C anopy balloon
gas exchange
system
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Leaf area removed (%)

- **Light**
- **Moderate**
- **Severe**

Treatments

- **1998**
- **1999**
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[Graph showing the relationship between leaf area removed by summer pruning and whole-canopy NCER (umol s⁻¹)]

- **Whole-canopy NCER (umol s⁻¹)**
  - 1998
  - 1999

- **Leaf area removed by summer pruning (%)**
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Reductions in whole-canopy net CO₂ exchange were approximately proportional to pruning severity and % leaf area removed.
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- Growth rate
- Final fruit weight
- Fruit quality
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Growth rate

Final fruit weight

Fruit quality
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% Fruit fresh weight increase 55 days after summer pruning

% LA removed by summer pruning

1999
1998
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Final fruit fresh weight (g) vs. Whole-canopy NCE per fruit (umol.s⁻¹)

Data points for 1998 and 1999 are shown.
Summer Pruning

Carbohydrate Supply

Fruit growth
Final size

Fruit Demand
Summer Pruning

Canopy Water usage

Fruit growth
Final size

Carbohydrate Supply

Fruit Demand
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![Graph showing the relationship between whole-canopy transpiration and percentage of leaf area removal over two years, 1998 and 1999.](image)
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