

Carbon Balance Dynamics to Integrate Whole Tree Physiology and Cultural Practices

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New York State Agricultural
Experiment Station

Challenges in

Whole Tree Physiology

research

Monitoring

Quantification

Simulation

Predicting

Challenges in

Whole Tree Physiology

research

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Challenges in

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Challenges in

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Predicting

Foundations for

Whole Tree Physiology

research

Radiation

Carbohydrate

Water

Nitrogen

Plant hormones

Foundations for

Whole Tree Physiology

research

Radiation

Carbohydrate

Water

Nitrogen

Plant hormones

Foundations for

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research

Radiation

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Plant hormones

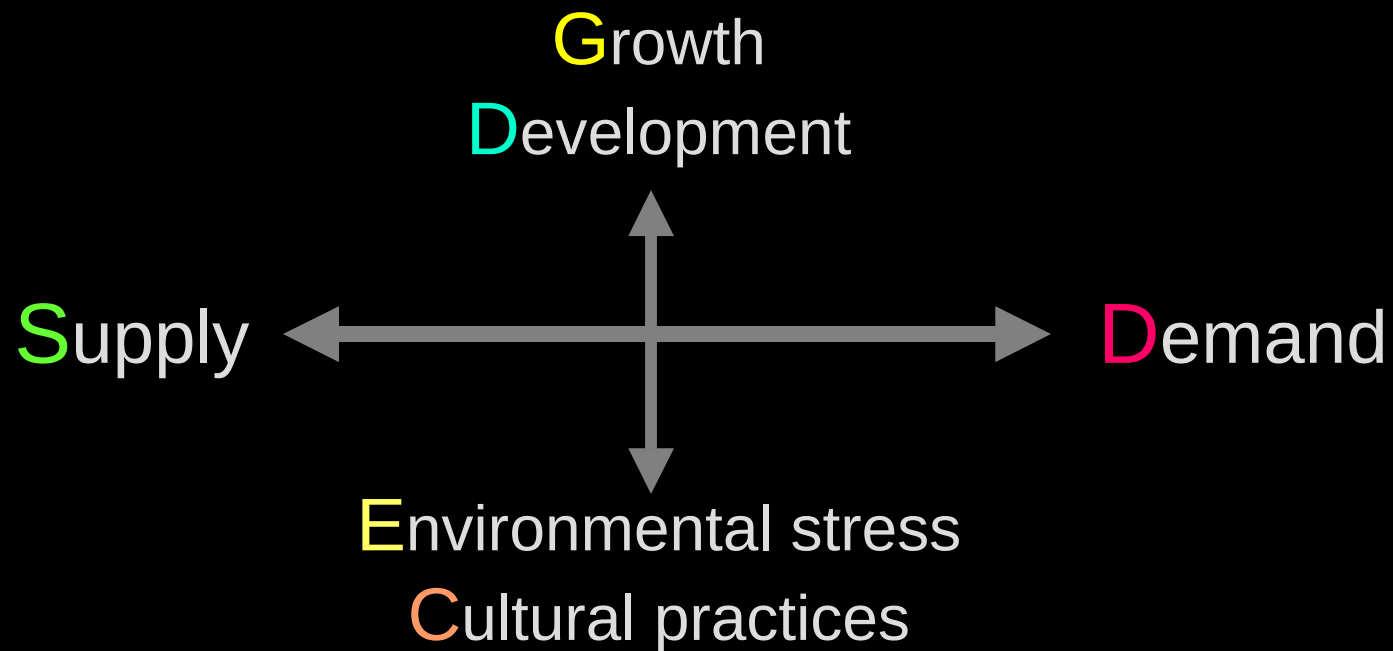
Carbon Balance Dynamics to

Integrate Whole Tree Physiology and
Cultural Practices

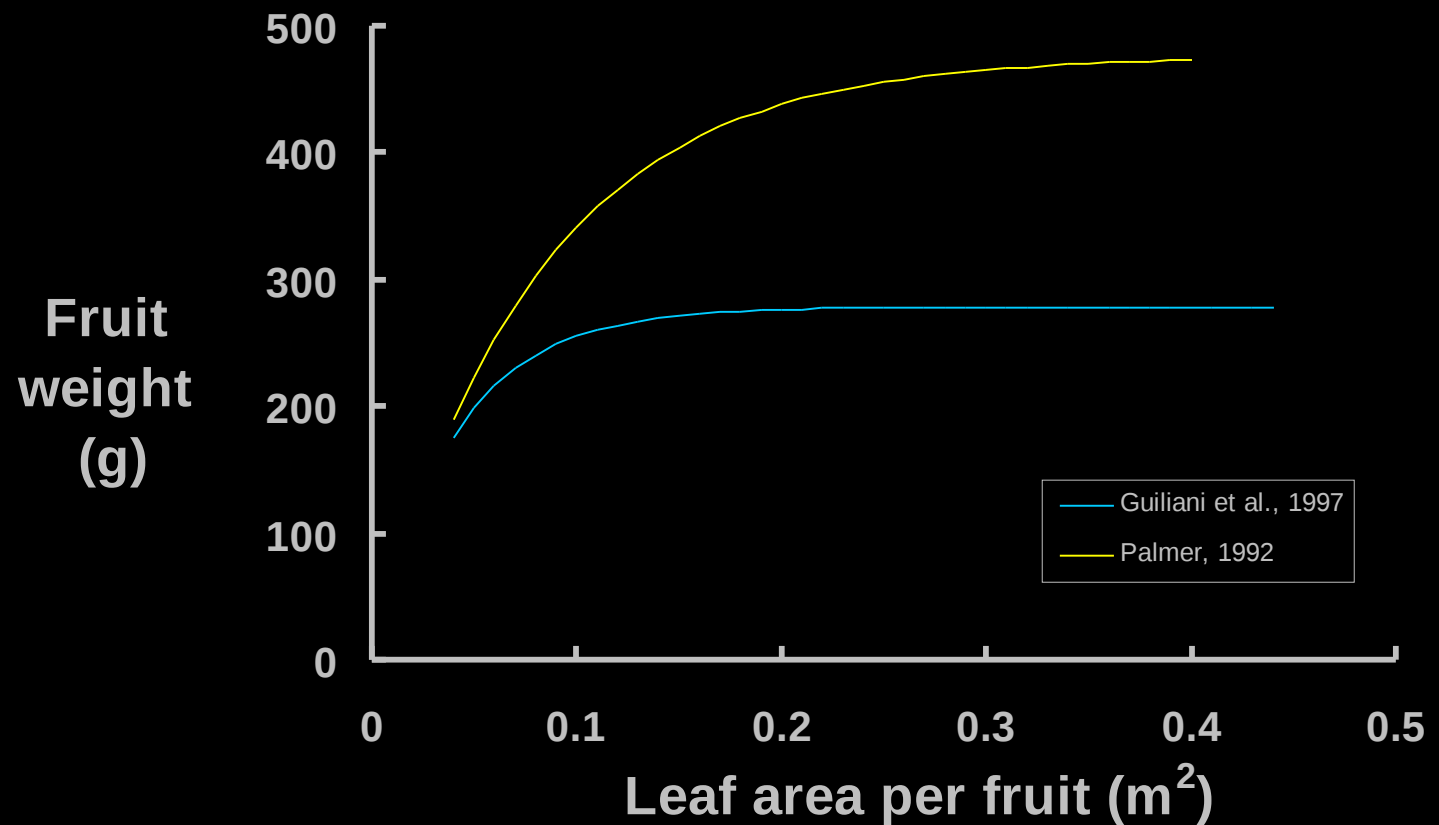
Simple

Affordable

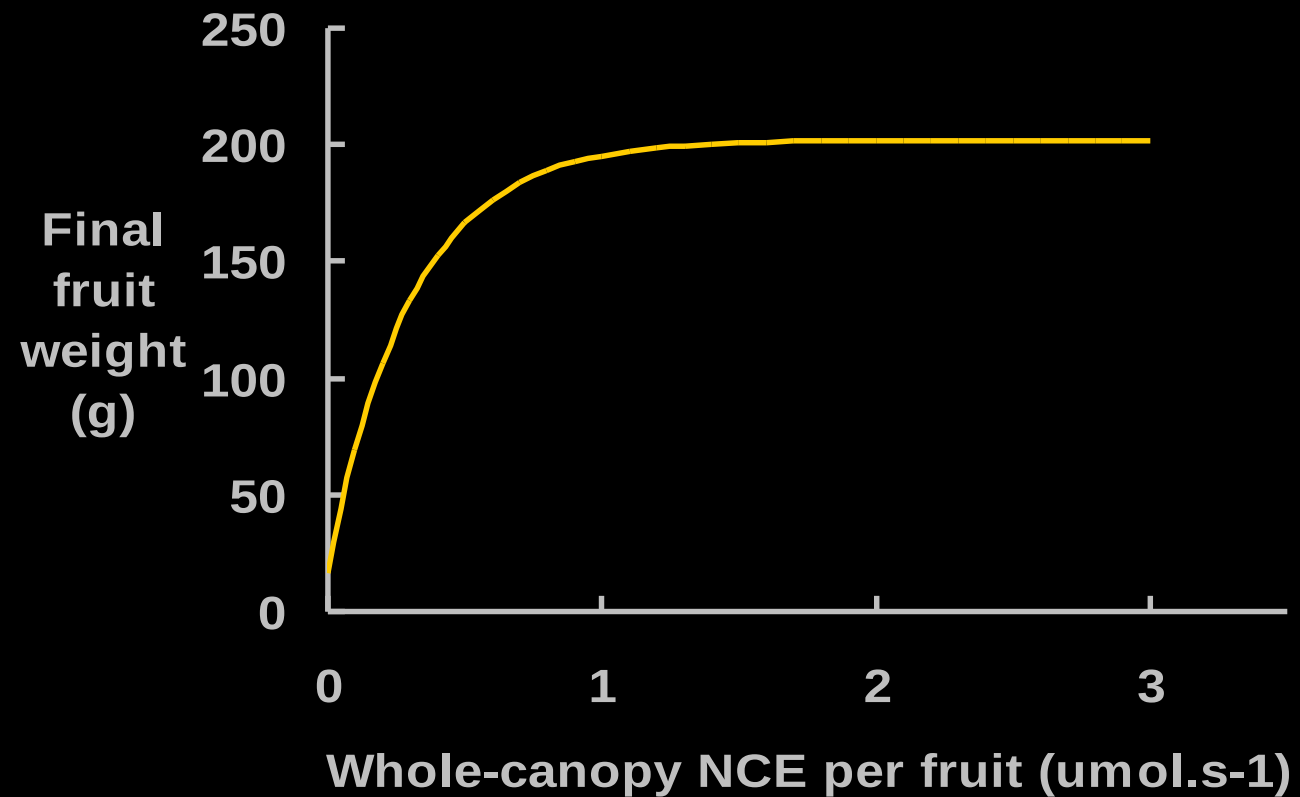
Carbon Balance Dynamics



Carbon Balance Dynamics

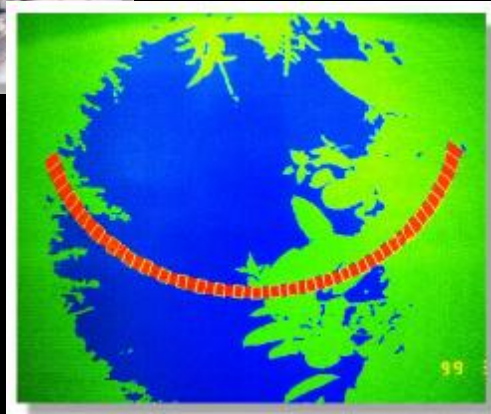
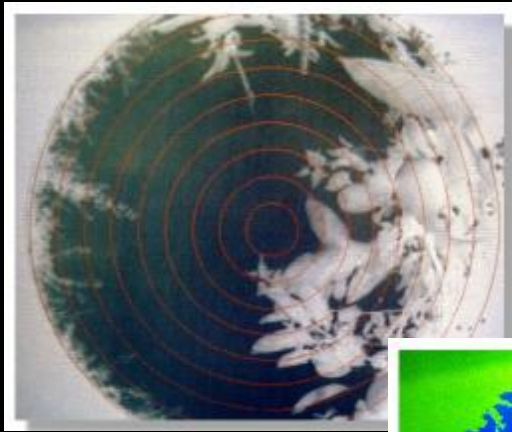


Carbon Balance Dynamics



Carbon Balance Dynamics to

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Monitoring

Quantification

Simulation

Predicting

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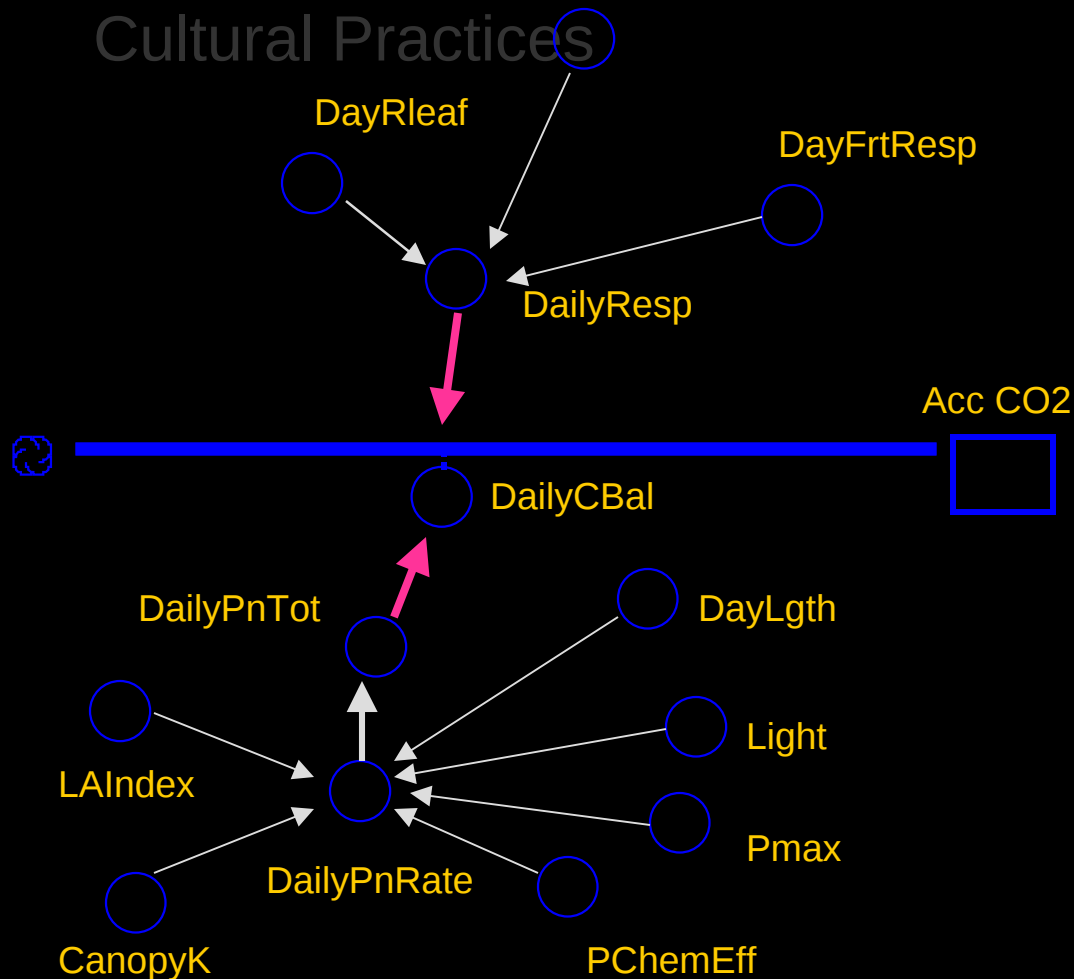
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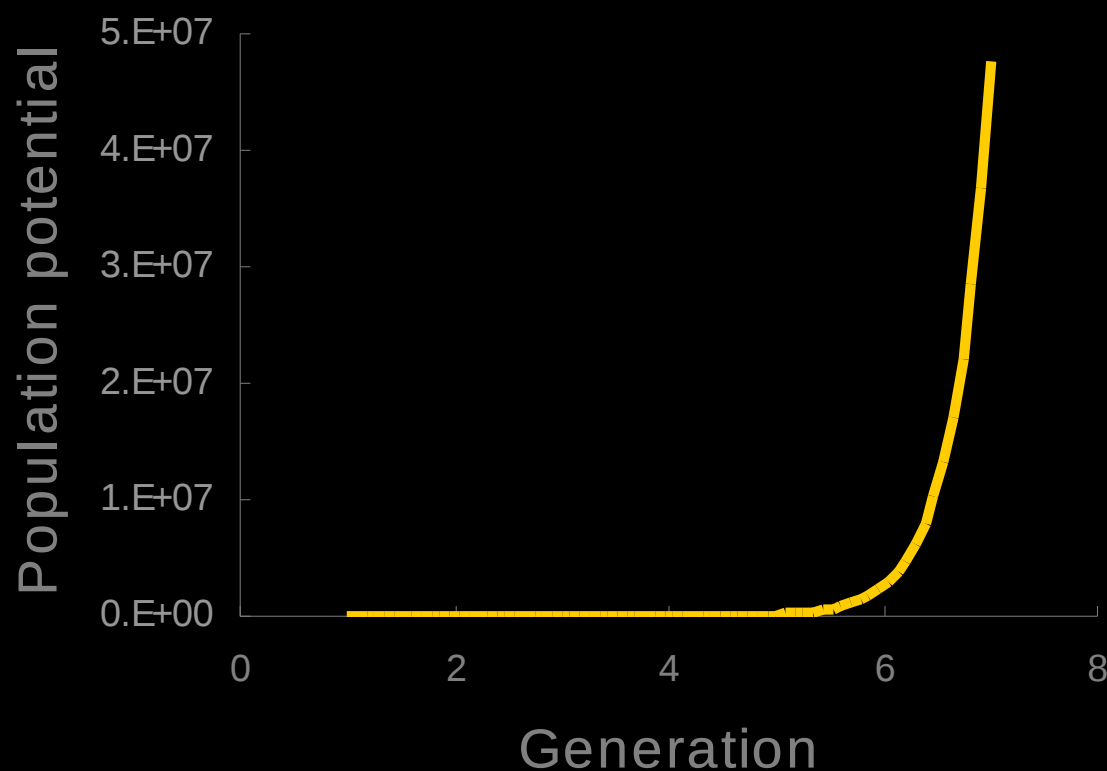
Monitoring

Quantification

Simulation

Predicting

Carbon Balance Dynamics to Integrate **Whole Tree Physiology** and **IPM** in Apple

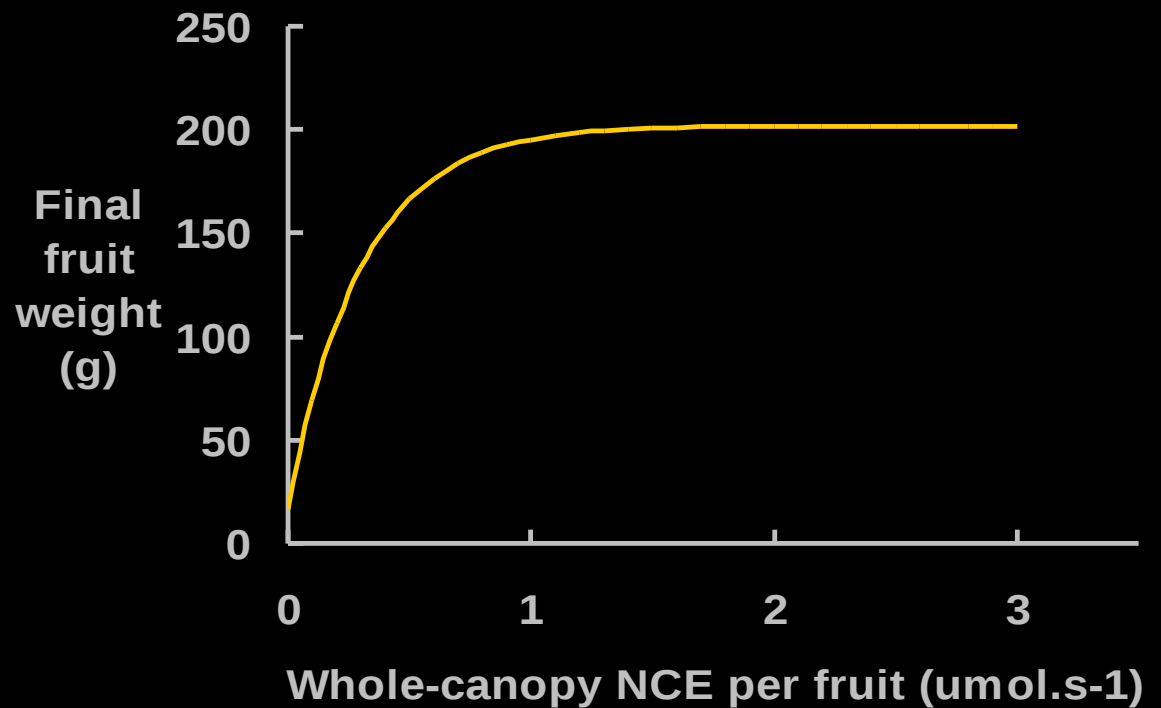


Integrated
Pest
Management

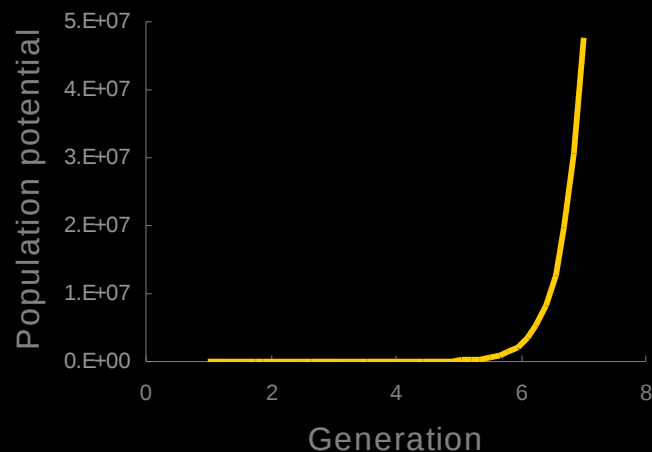


Carbon Balance Dynamics to Integrate Whole Tree Physiology and IPM in Apple

European red mite
and
cropping effect
in Red Delicious

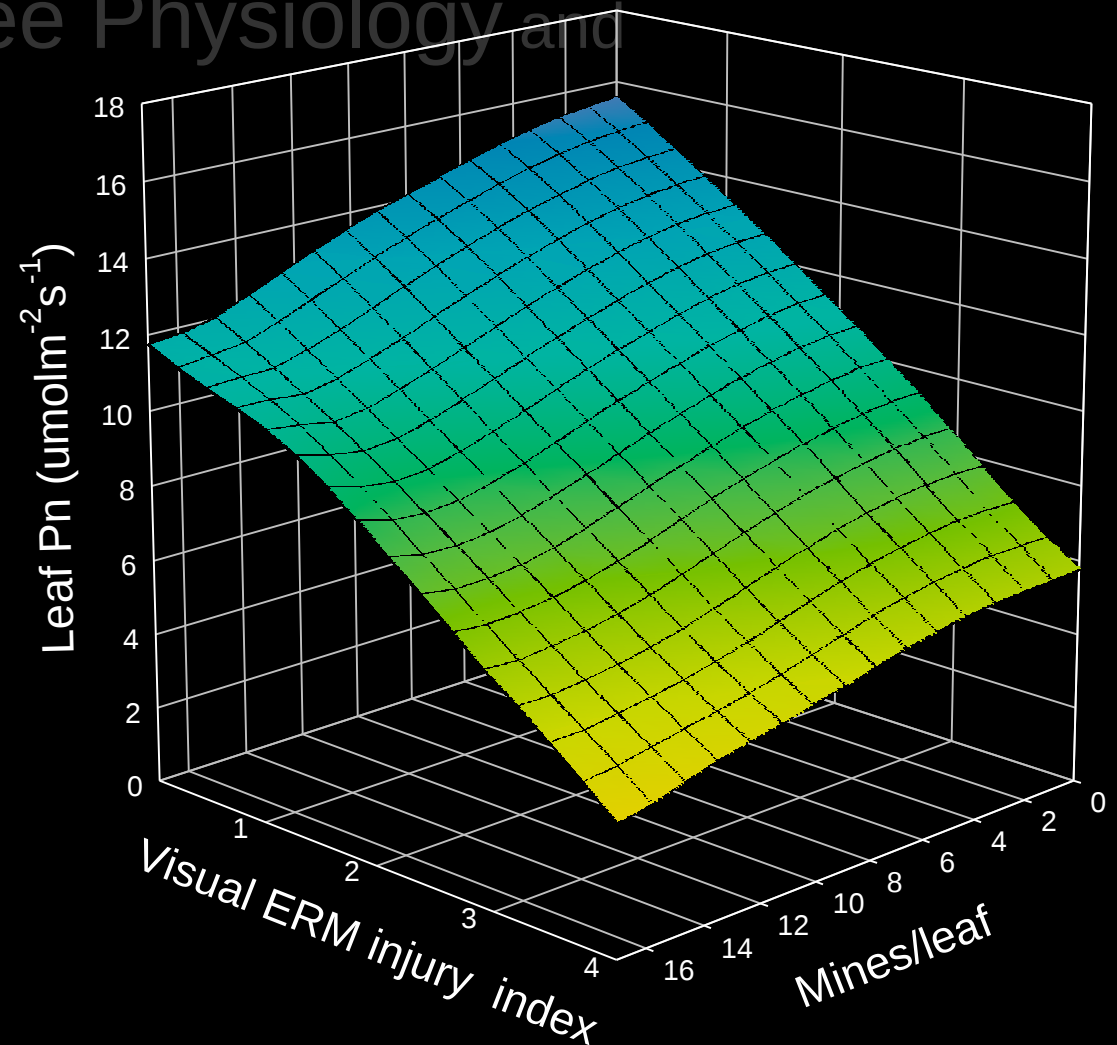


Carbon Balance Dynamics to Integrate **Whole Tree Physiology** and **IPM** in Apple



Carbon Balance Dynamics to Integrate Whole Tree Physiology and IPM in Apple

Additive action
thresholds for
STLM & ERM



Carbon Balance Dynamics to
Integrate **Whole Tree Physiology** and
Summer Pruning in Apple

Summer Pruning

C Control tree size

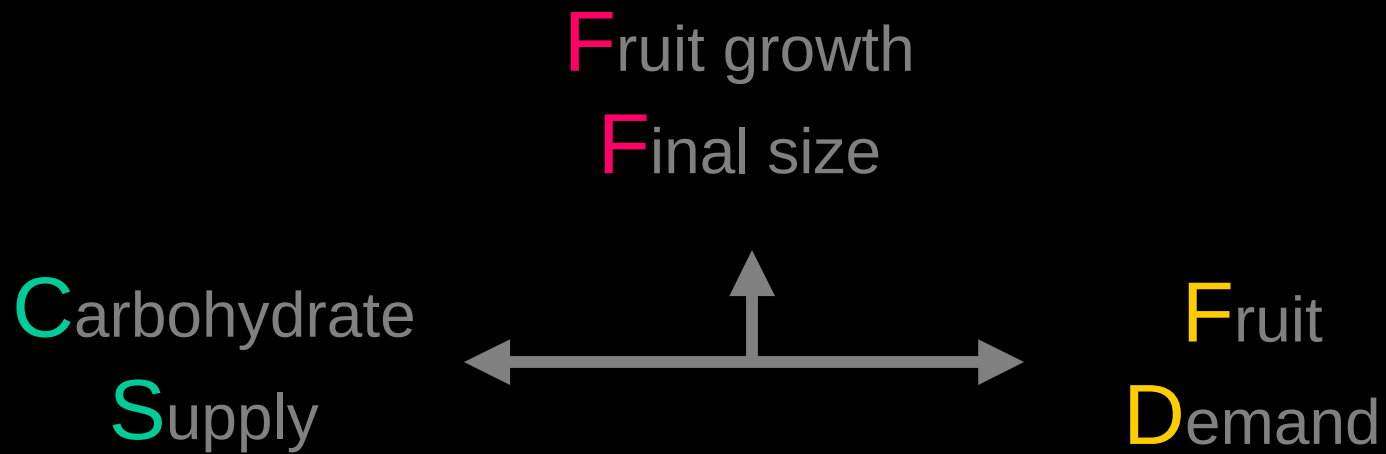
I Improve fruit color

S Smaller fruit size

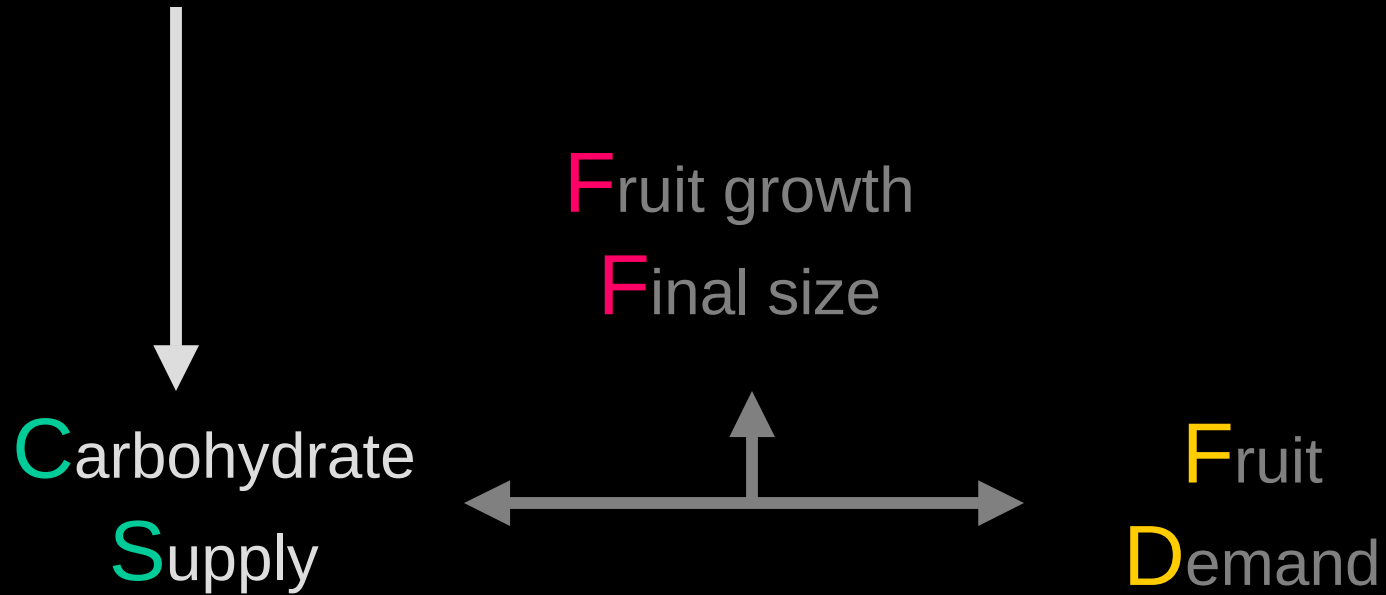
L Lower final yield

I Inferior fruit quality

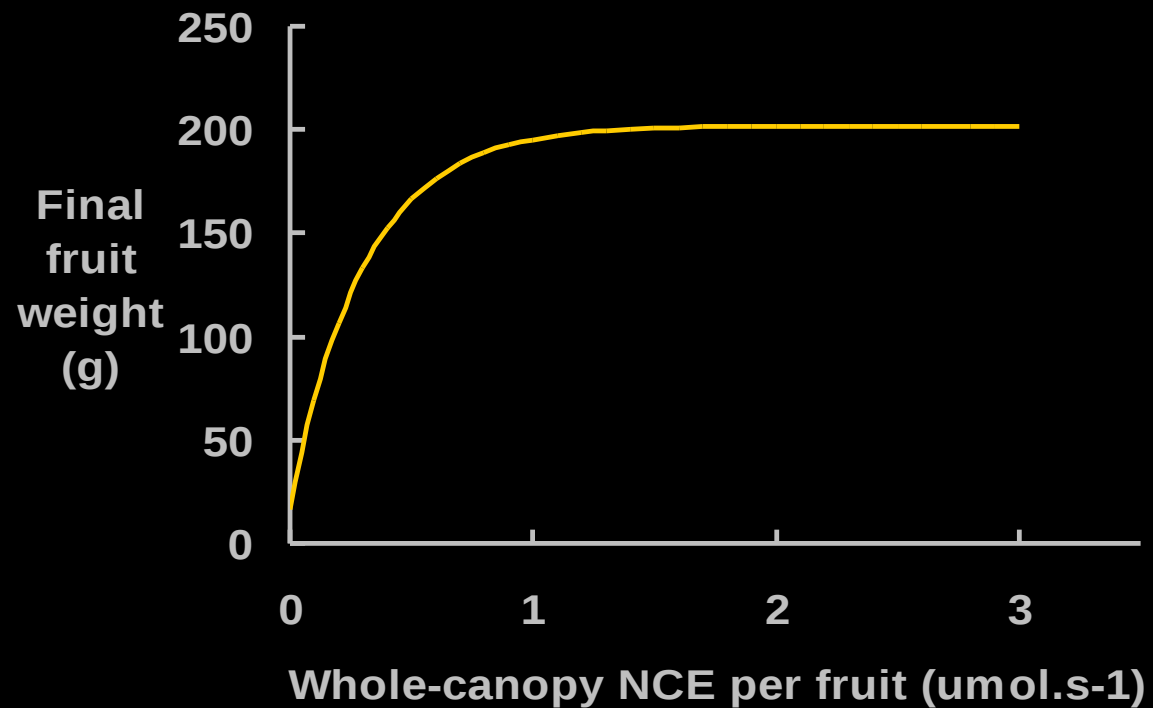
Summer Pruning



Summer Pruning



Carbon Balance Dynamics to Integrate Whole Tree Physiology and Summer Pruning in Apple

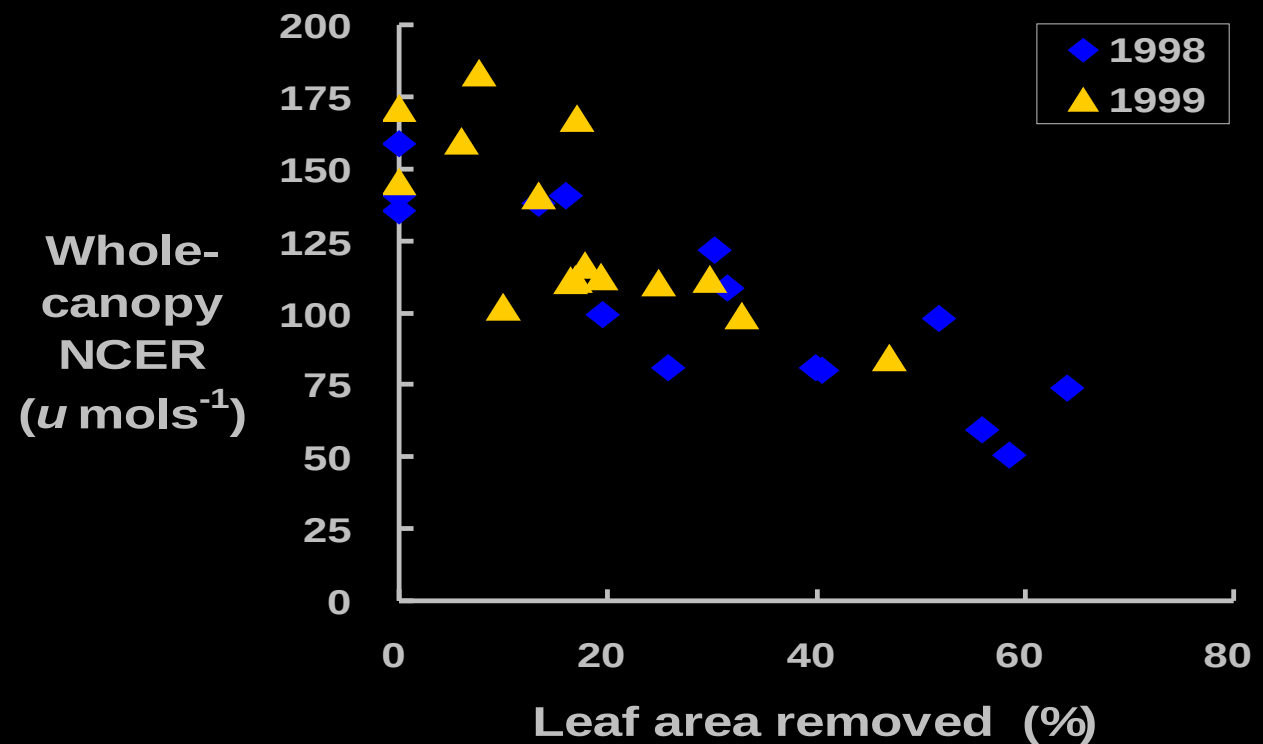




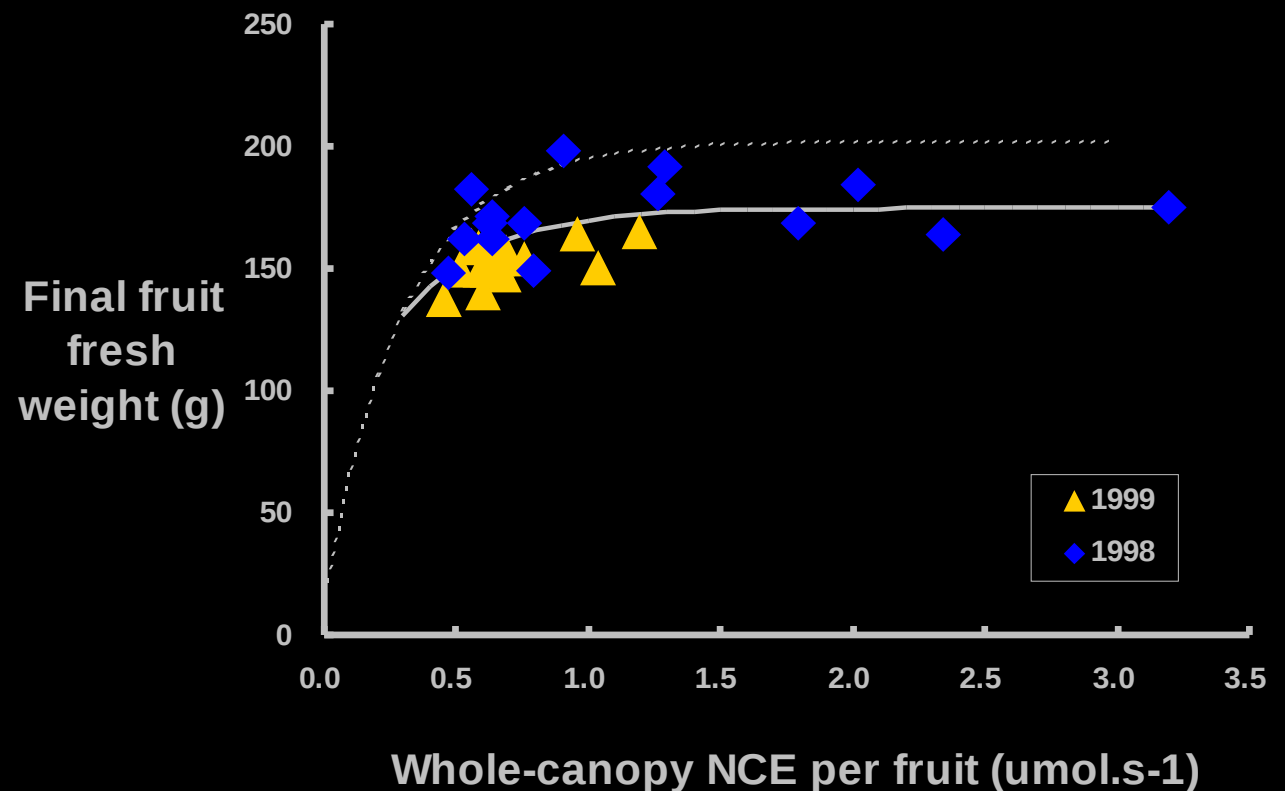
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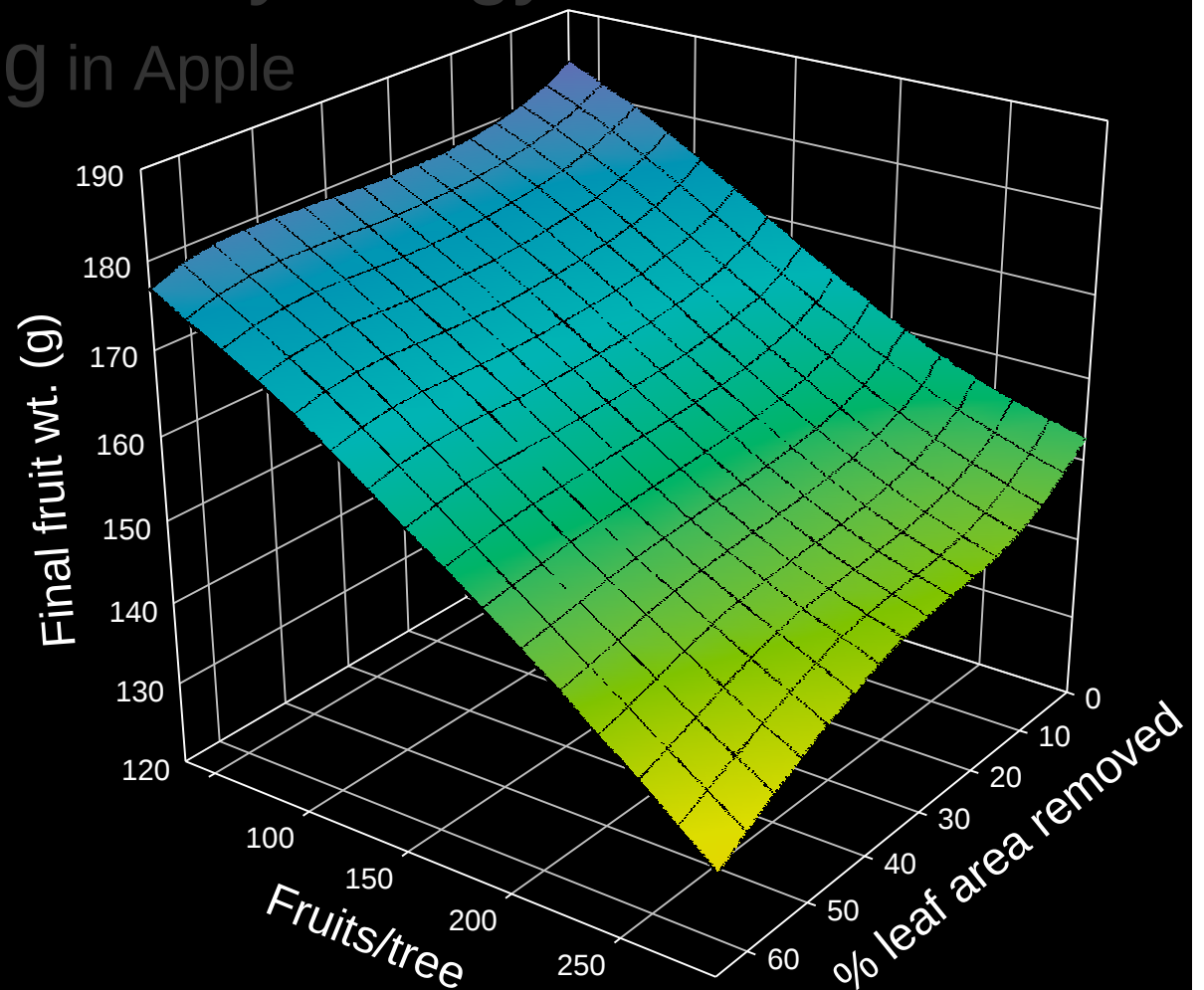
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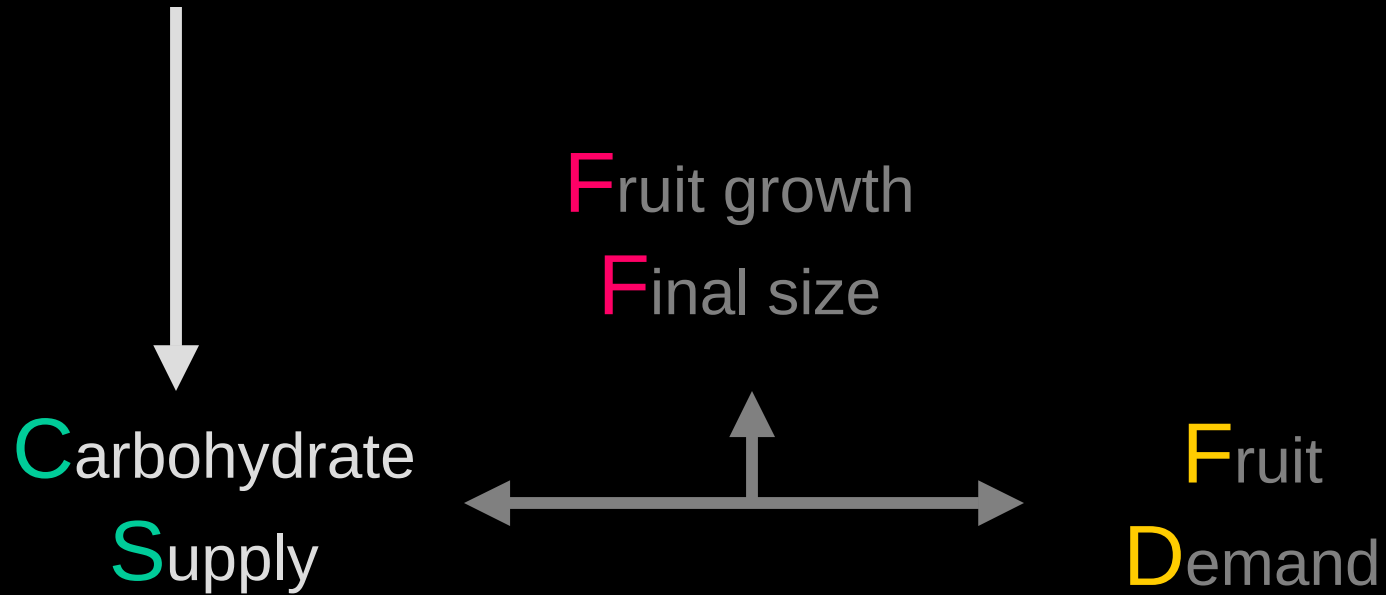
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Carbon Balance Dynamics to Integrate Whole Tree Physiology and Summer Pruning in Apple

Light or moderate
summer pruning
had little influence
on fruit size in a
well-managed
orchard

Summer Pruning



Carbon Balance Dynamics to Integrate Whole Tree Physiology and Summer Pruning in Apple

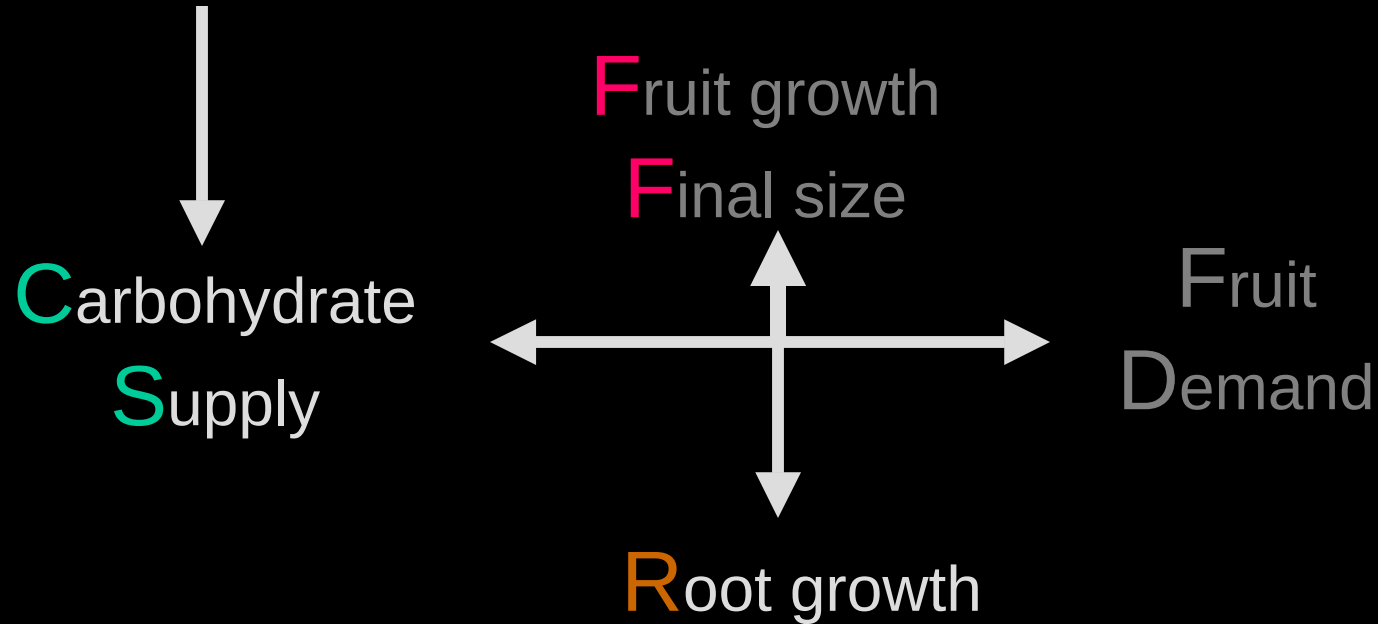
Carbon balance

Sink competition

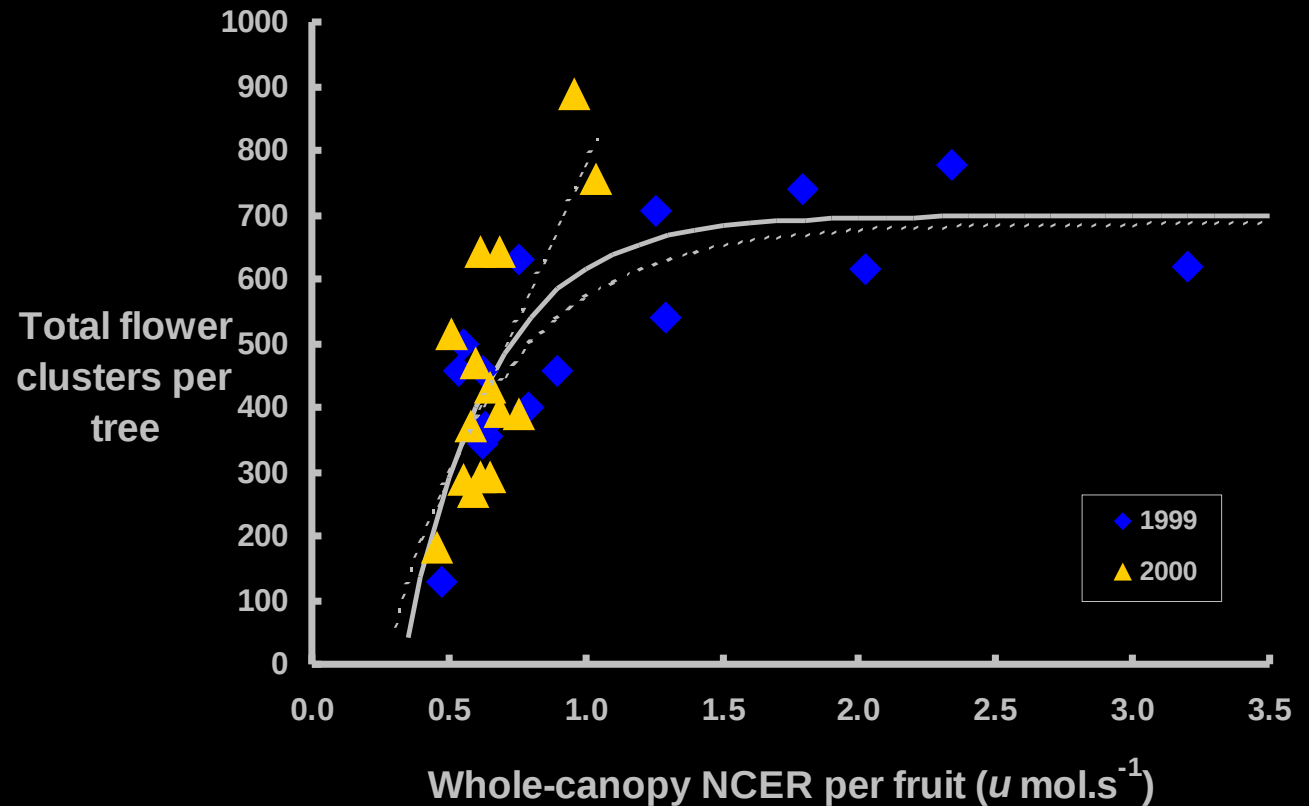
Canopy transpiration

Weather

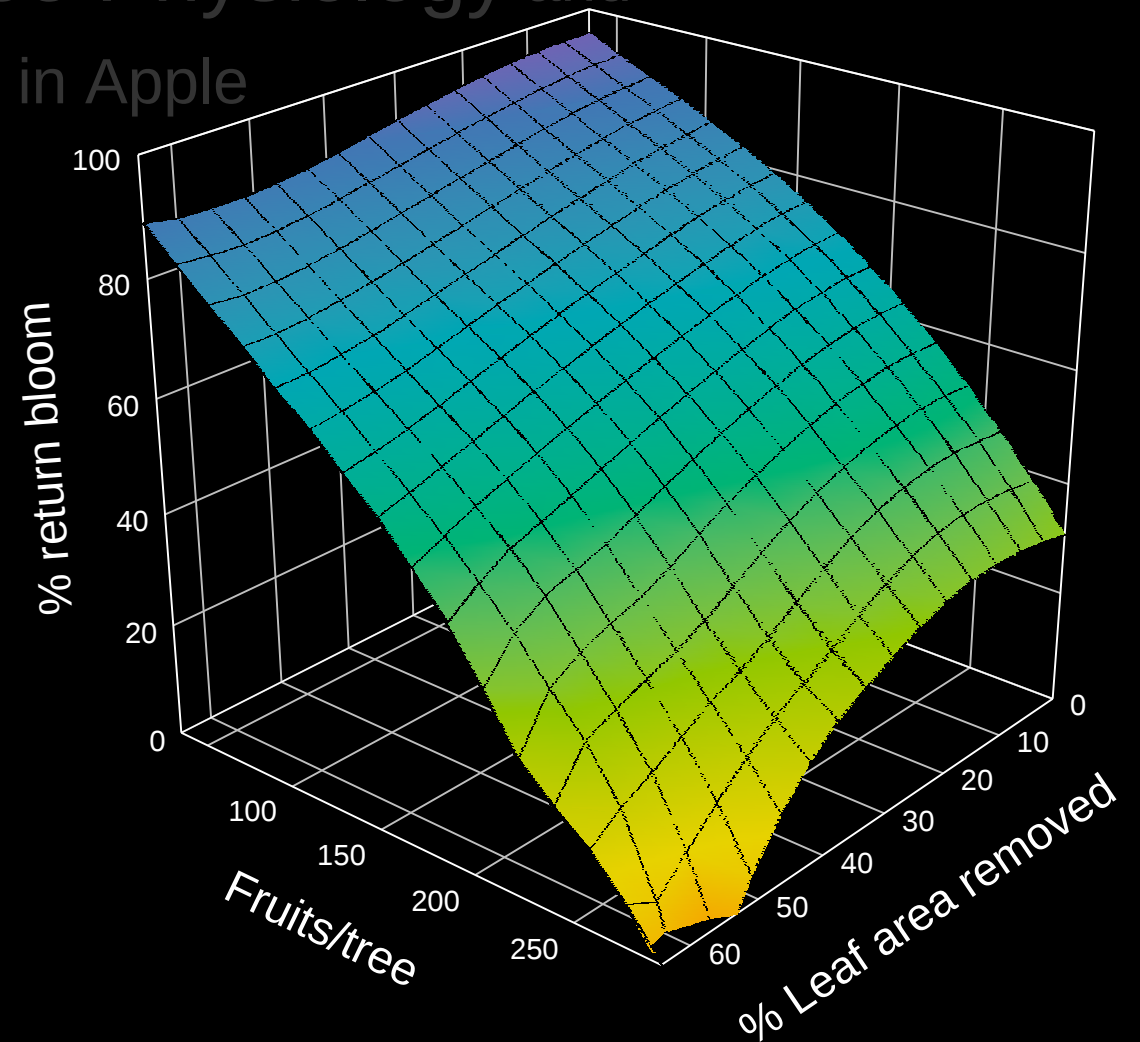
Summer Pruning



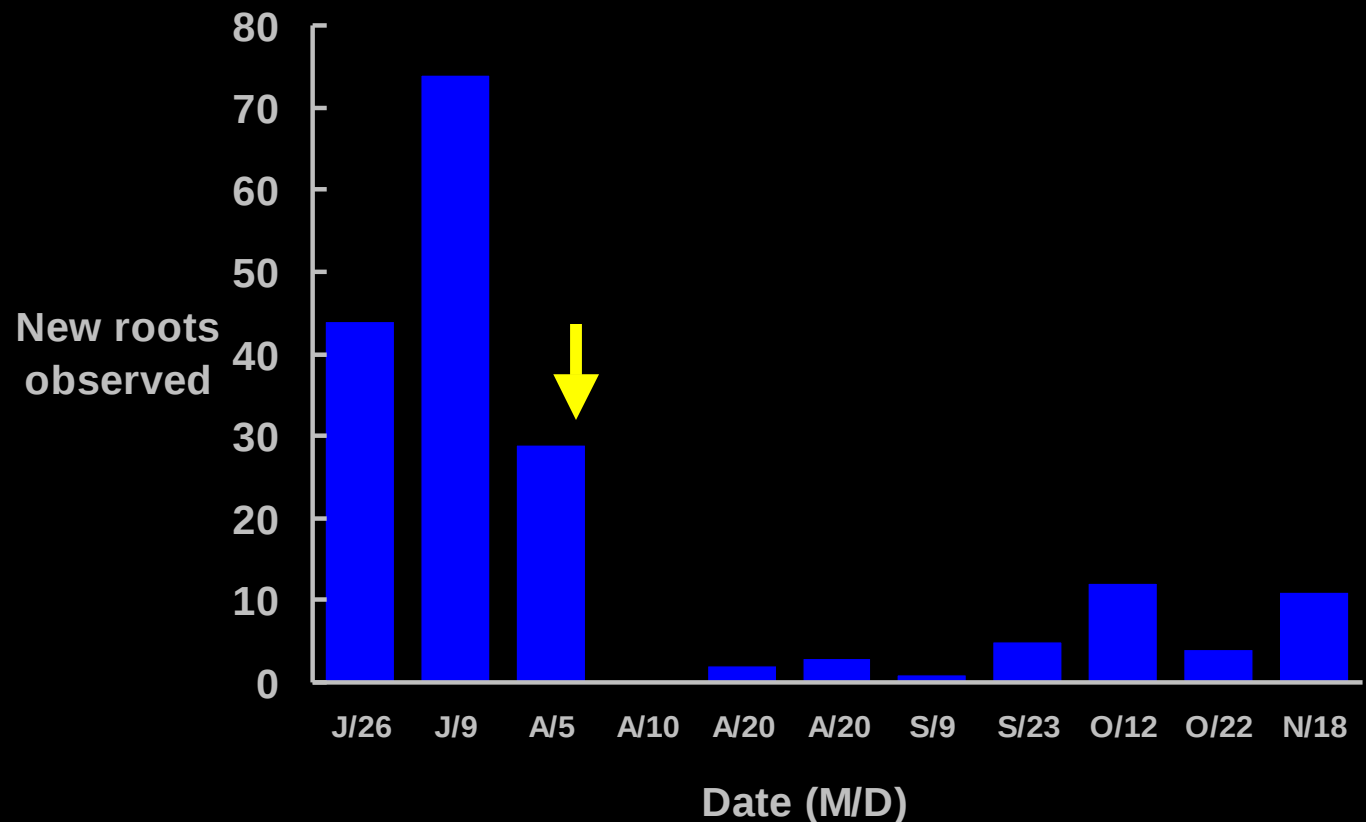
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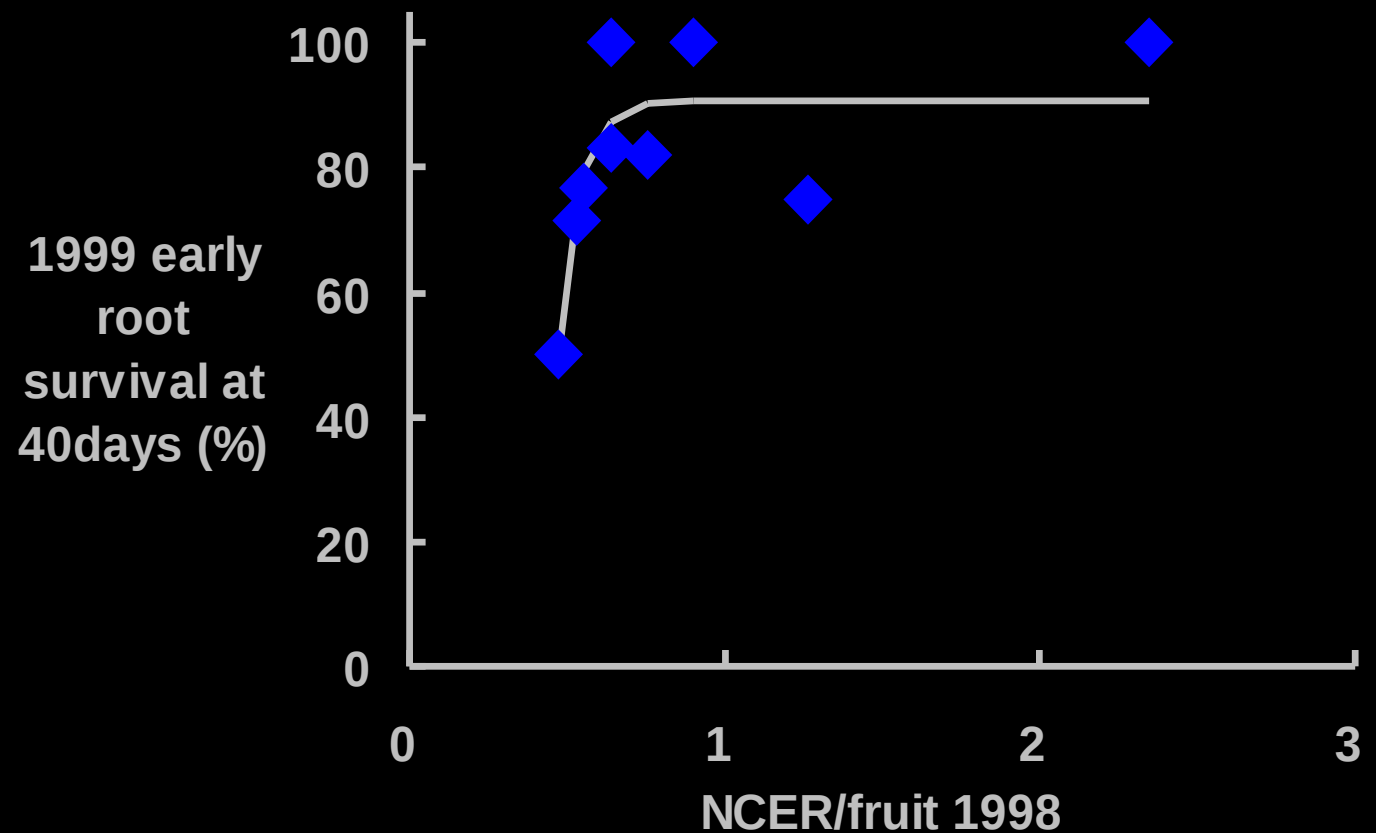
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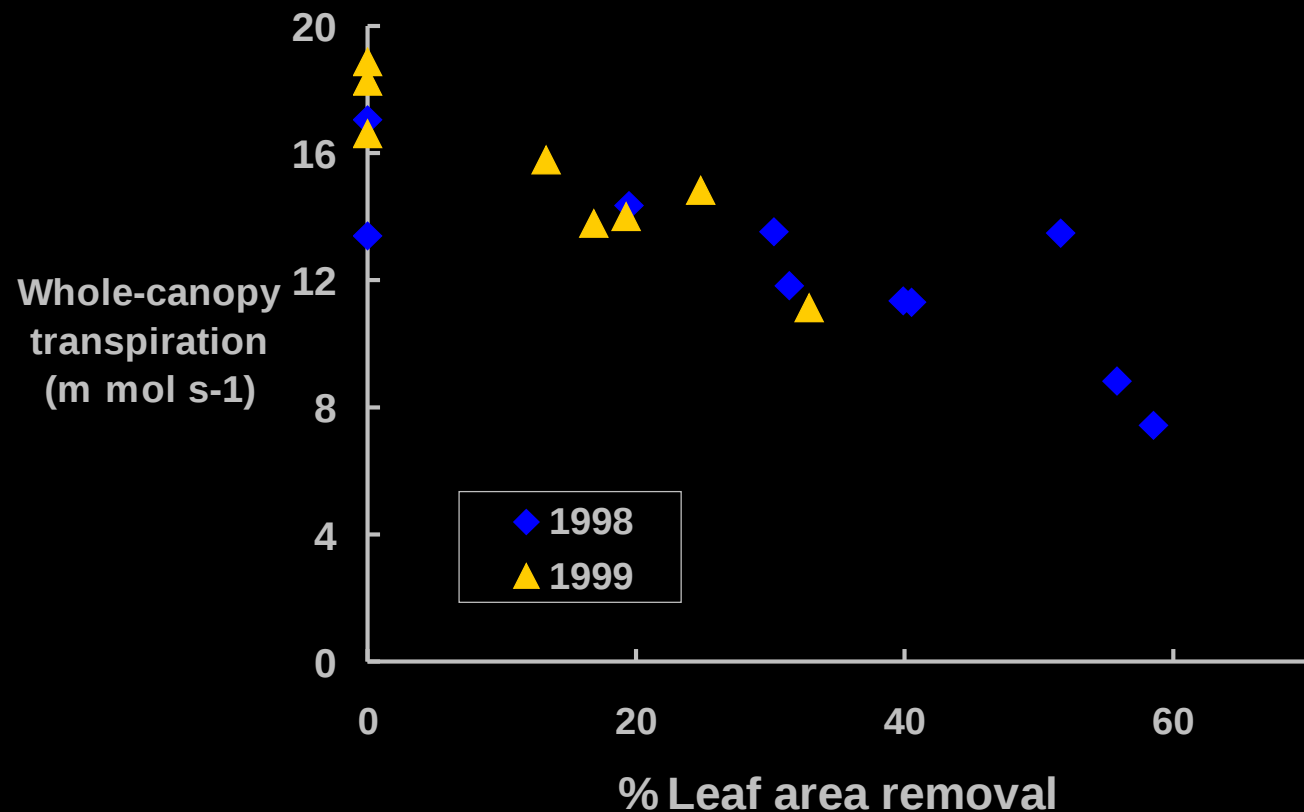
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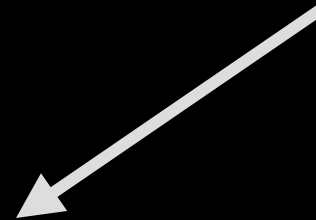
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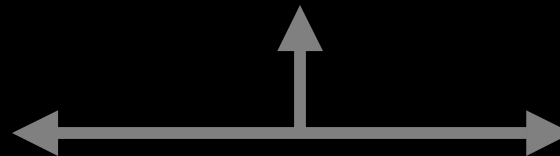
Summer Pruning



Canopy
Water usage



Fruit growth
Final size



Carbohydrate
Supply

Fruit
Demand

Carbon Balance Dynamics to Integrate Whole Tree Physiology and Summer Pruning in Apple

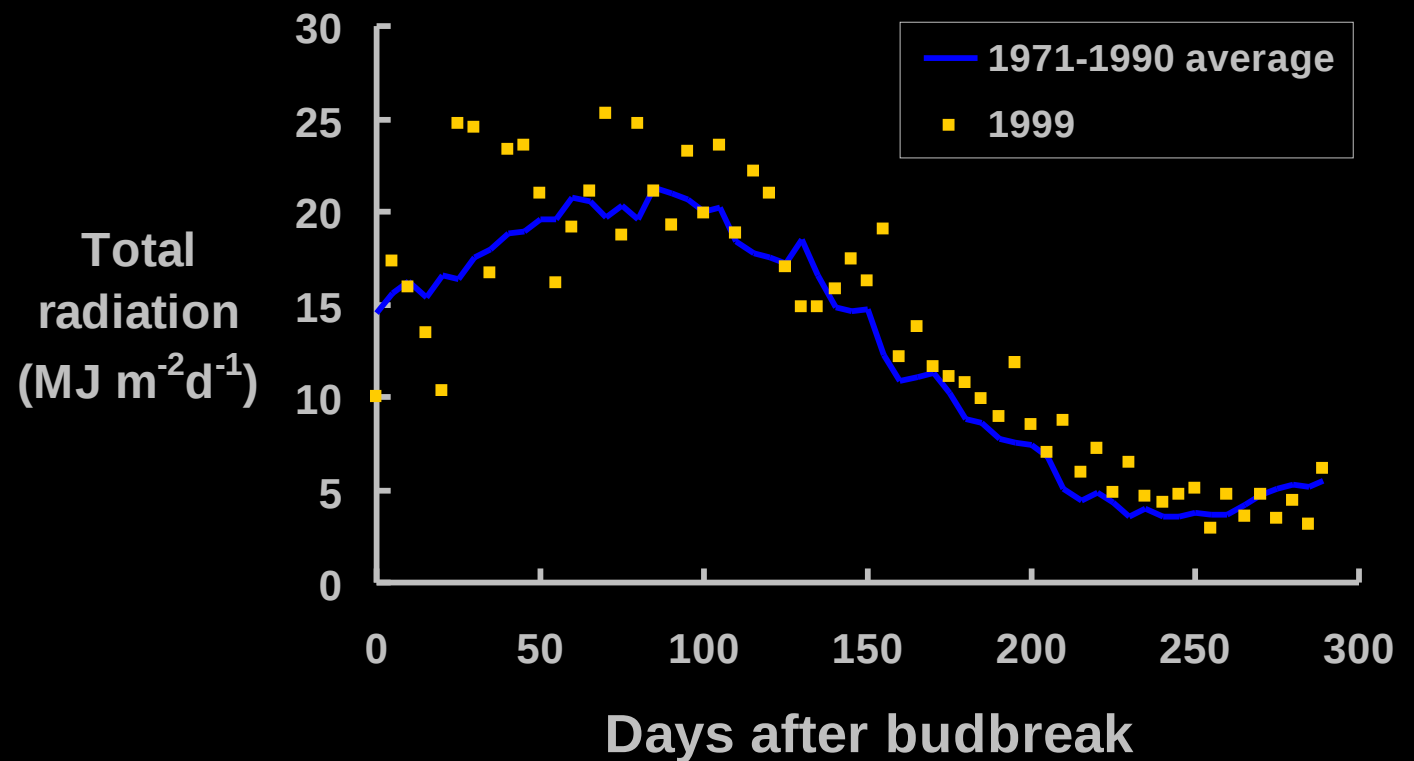
Carbon balance

Sink competition

Canopy transpiration

Weather

Carbon Balance Dynamics to Integrate Whole Tree Physiology and Summer Pruning in Apple



Summer Pruning



Canopy
Water usage

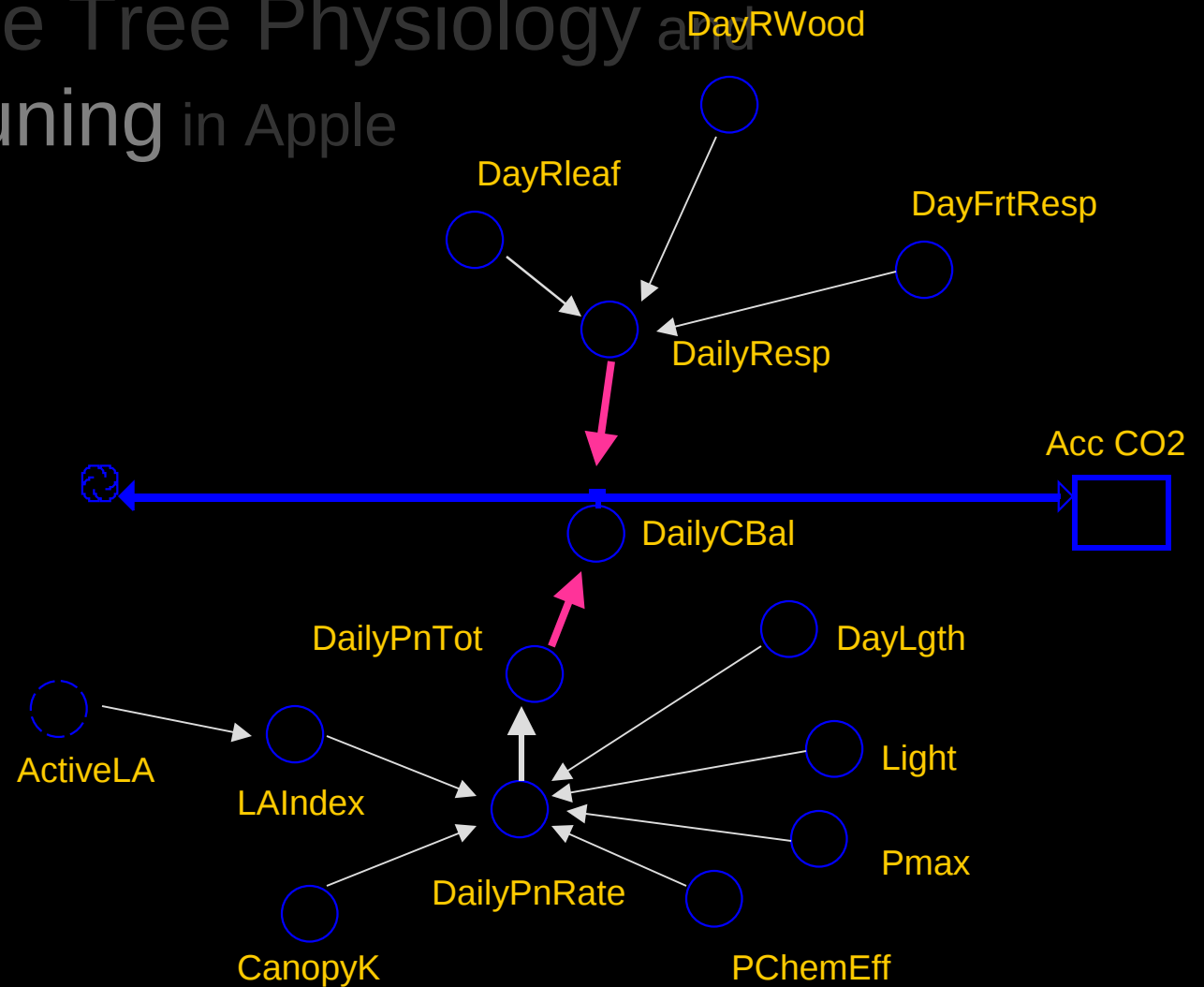


Carbohydrate
Supply

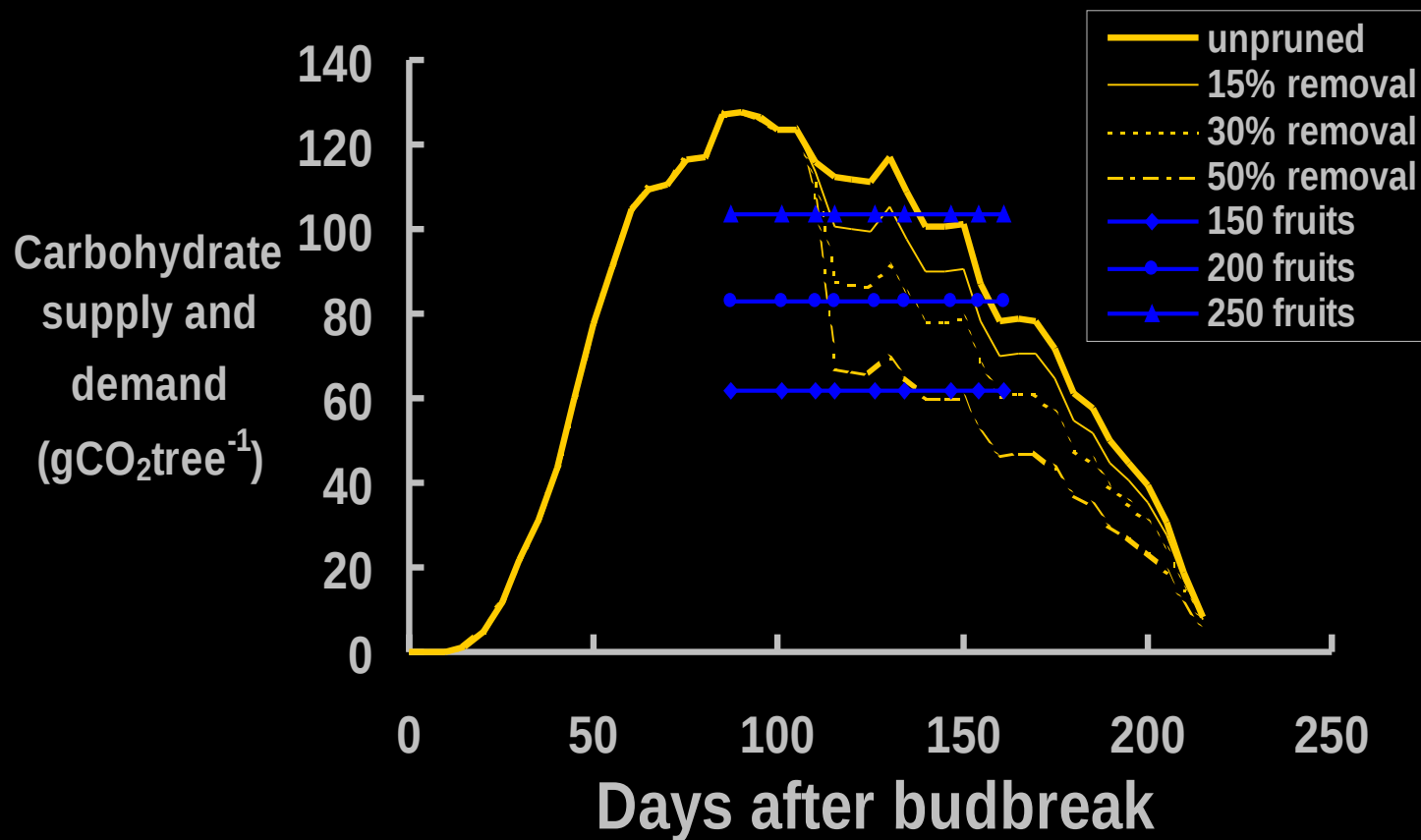


Weather

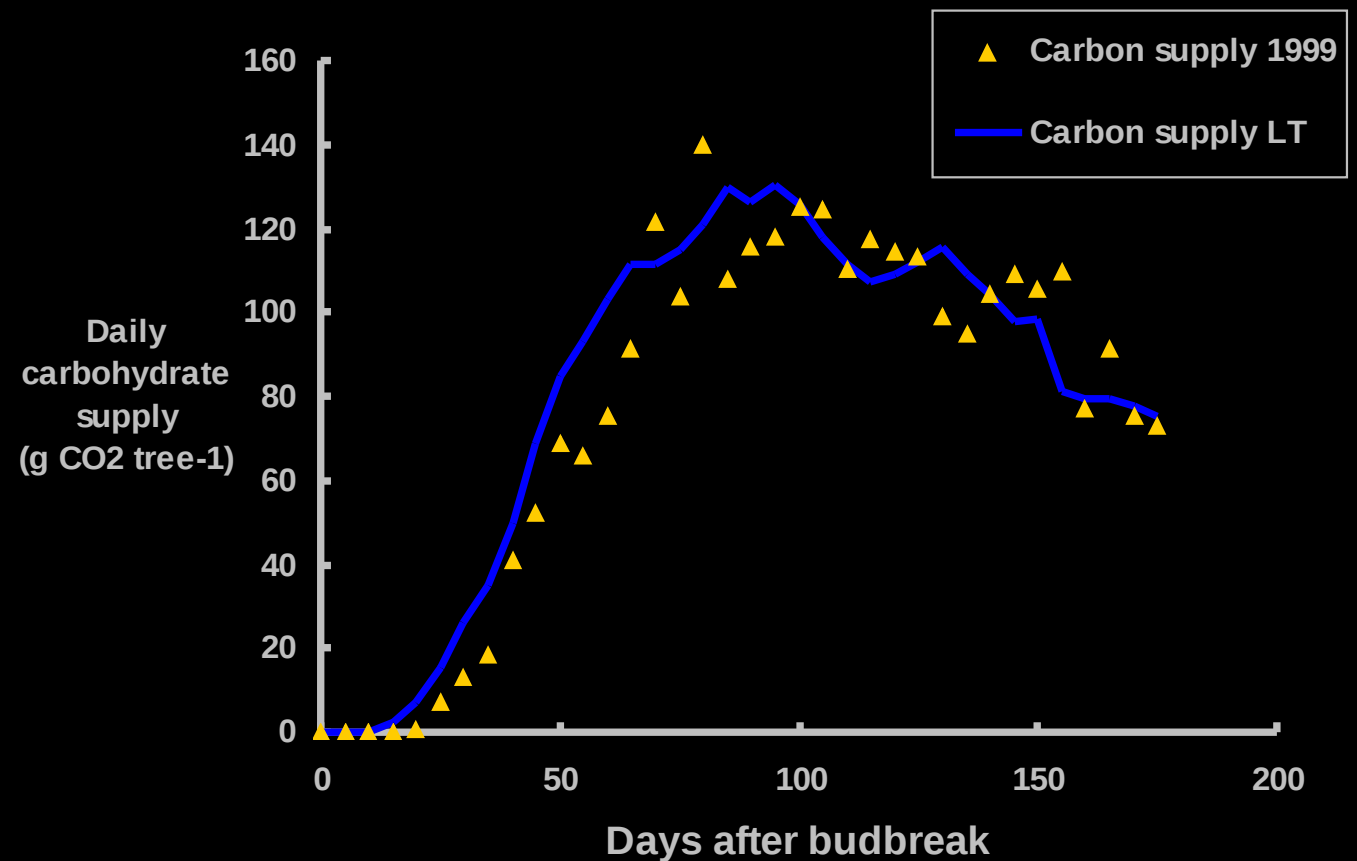
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Summer Pruning



Canopy
Water usage



Carbohydrate
Supply



Weather