

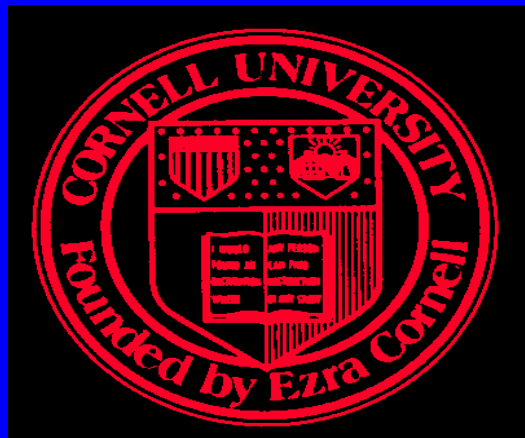
# How To Grow Large Gala's.

Terence Robinson, Mike Fargione, Lailiang  
Cheng, Steve Hoying and Jim Schupp.

Dept. of Horticultural Sciences

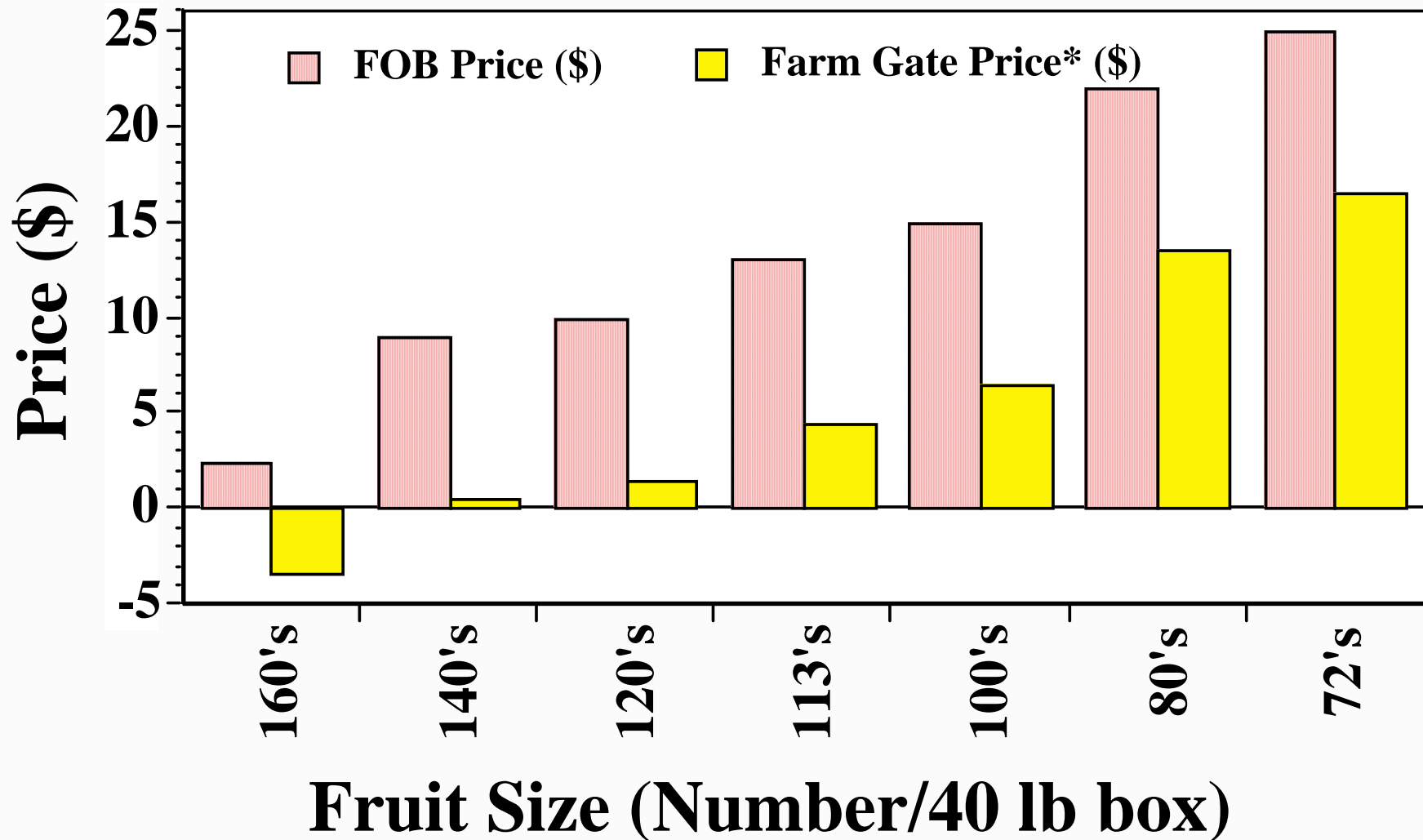
Cornell University

Geneva, NY 14456



# The Problem

- The fresh market rewards large fruit size.



\*Excludes picking, storage, packing and sales charges.

- **Gala is genetically small fruited.**

- **Gala is very fruitful and often oversets.**

- **Gala produces flowers and fruits on one year wood.**

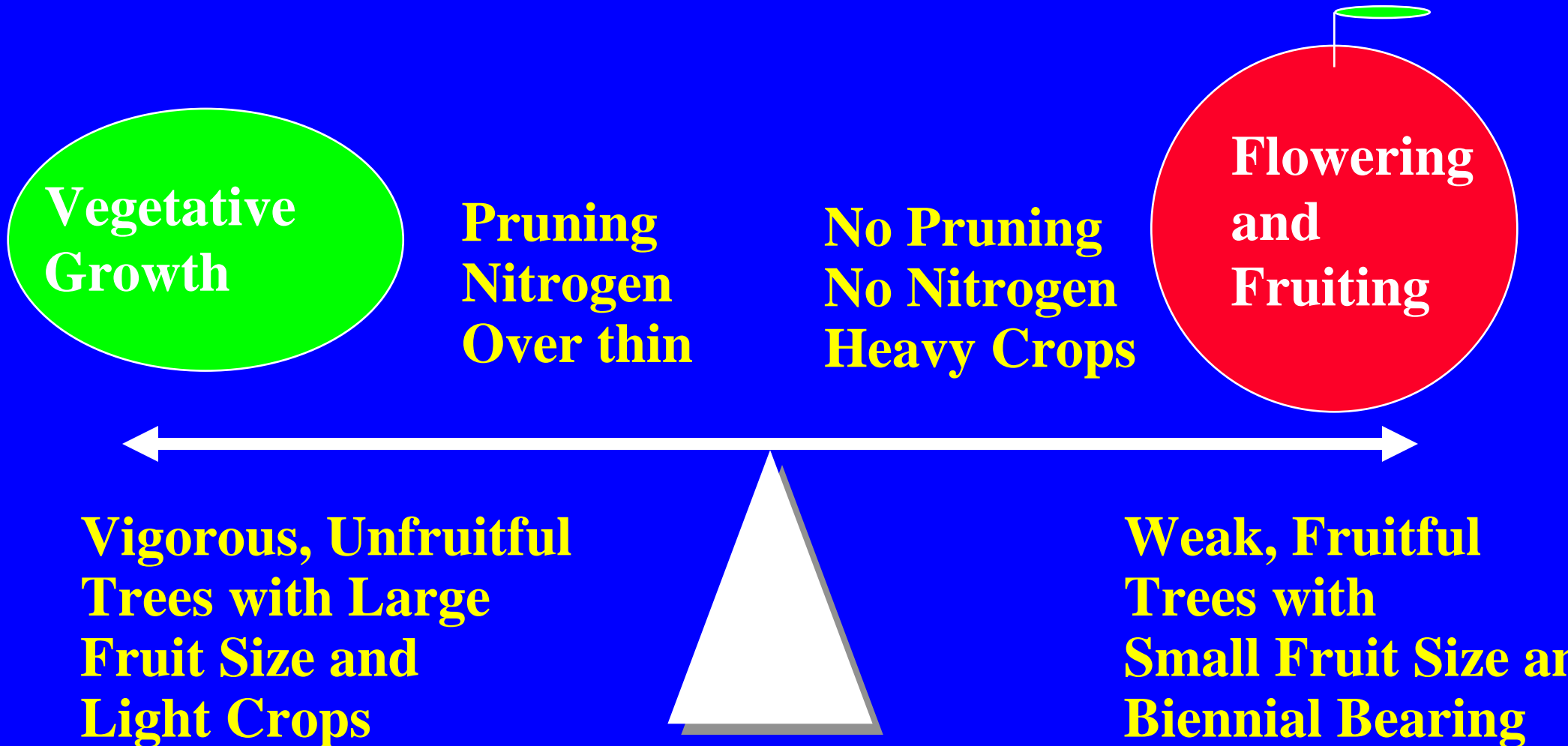
- **Gala is difficult to thin with standard chemical thinners.**



# Approaches to Improving Fruit Size

- **Climatic effects on fruit size.**
  - **Warm Temperatures during the period from bloom to 50 DAFB result in greater fruit size.**
  - **High light climates results in greater fruit size.**
- **Management**
  - **Pruning.**
  - **Fertilization.**
  - **Thinning.**
  - **Irrigation.**

# The Balance Between Vegetative Growth and Fruiting



# Pruning Approaches to Improving Fruit Size

- **Limb Renewal Pruning.**
- **Spur Pruning (Spur Extinction).**
- **Stubbing Back Pruning.**



## •Limb Renewal Pruning

- Annual removal of 1-2 limbs with minimal detail pruning.



**Spur Pruning (Spur Extinction)= Removal of 1/3 of all spurs on each branch plus removal of 1-2 branches completely.**

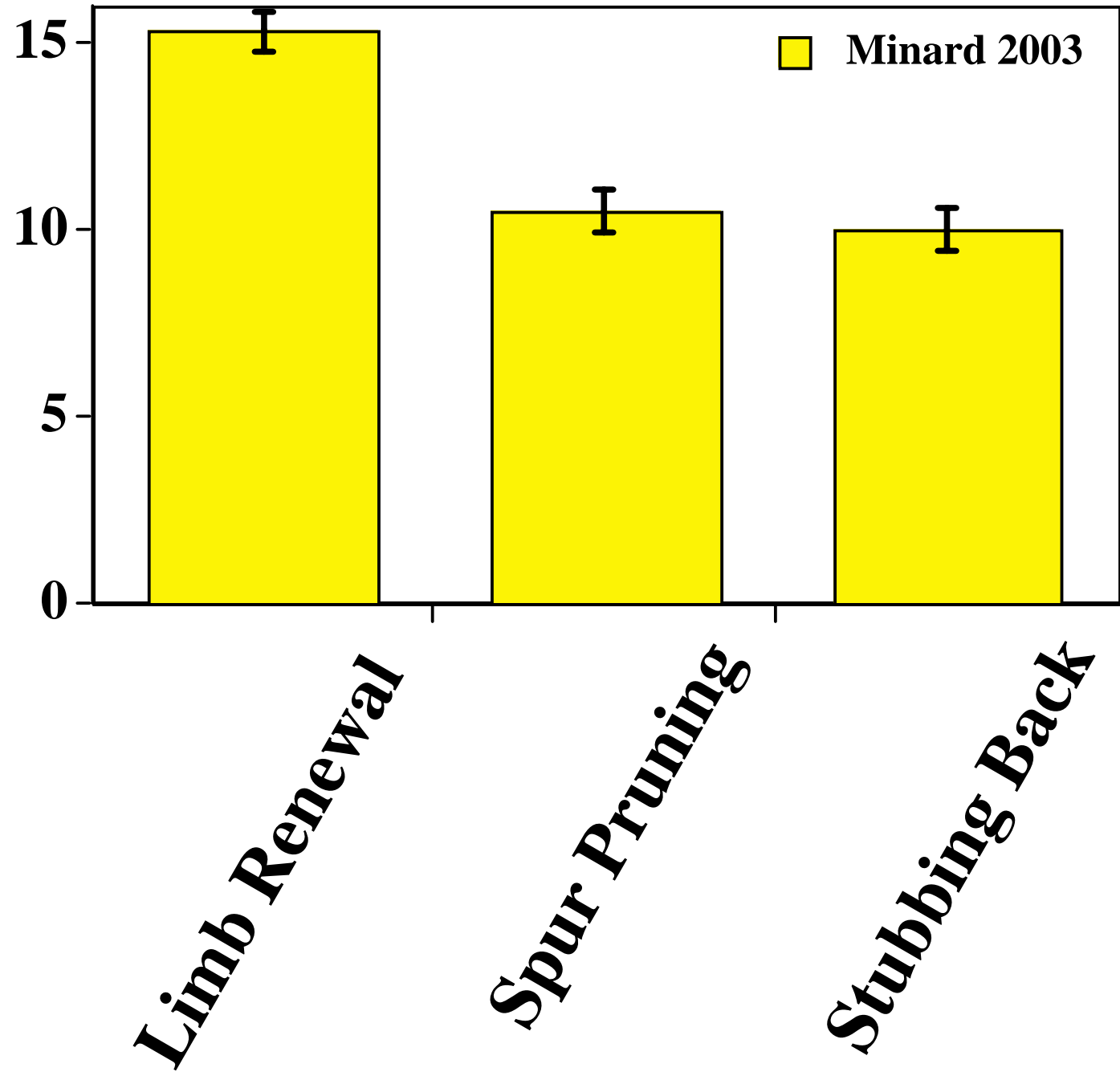


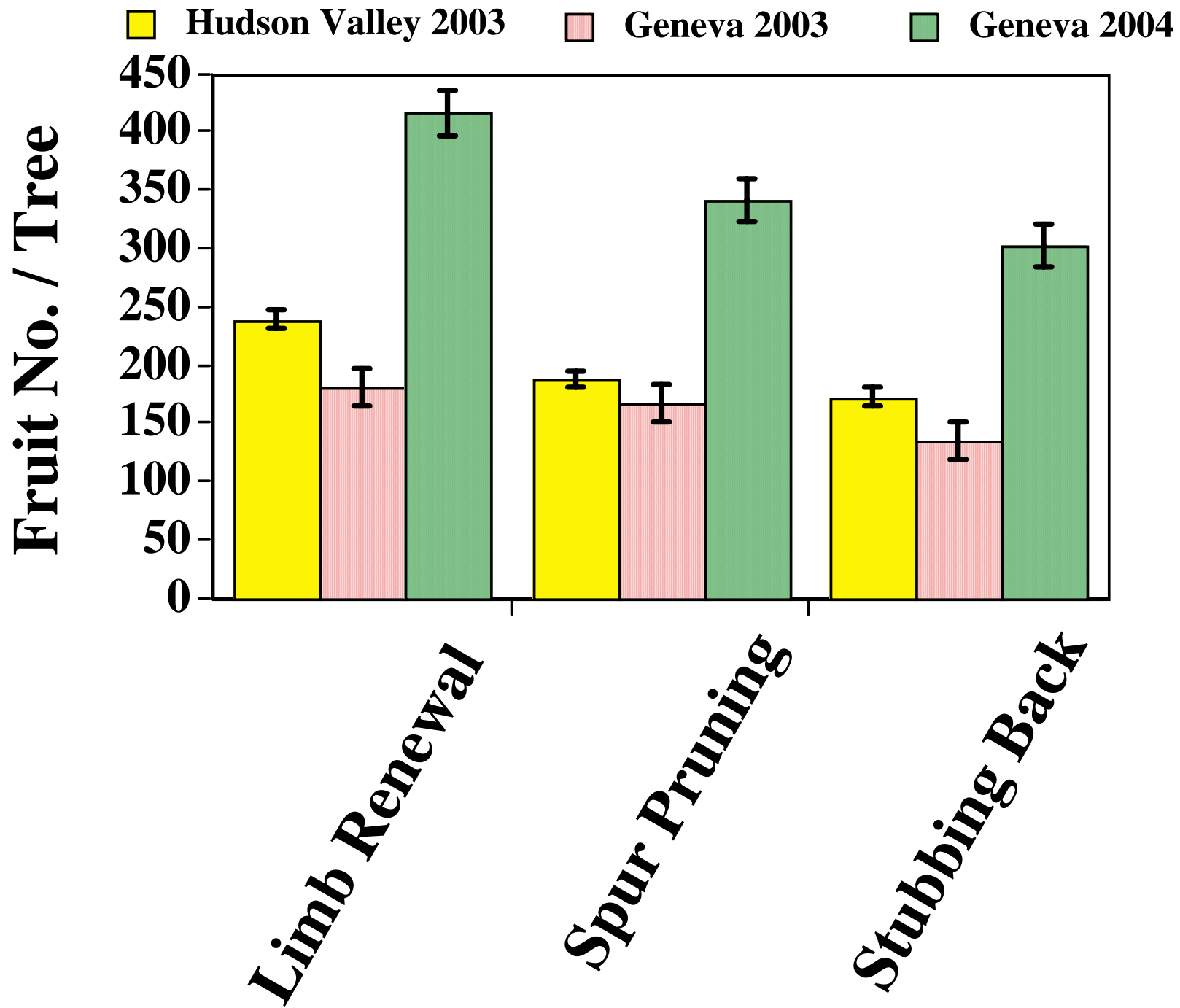


**Stubbing Back Pruning=Removal of distal 1/3 of each branch plus removal of 1-2 branches completely.**

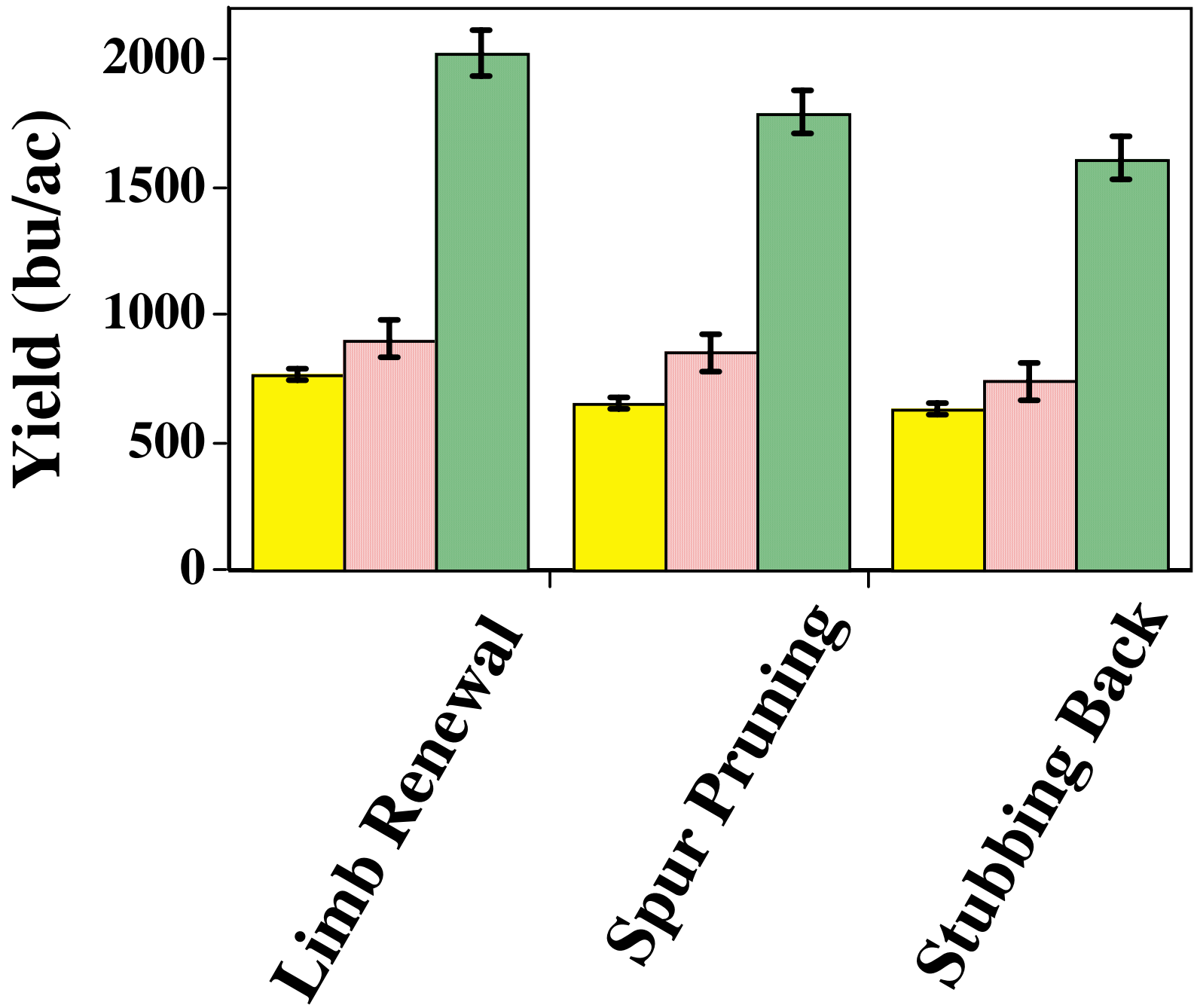


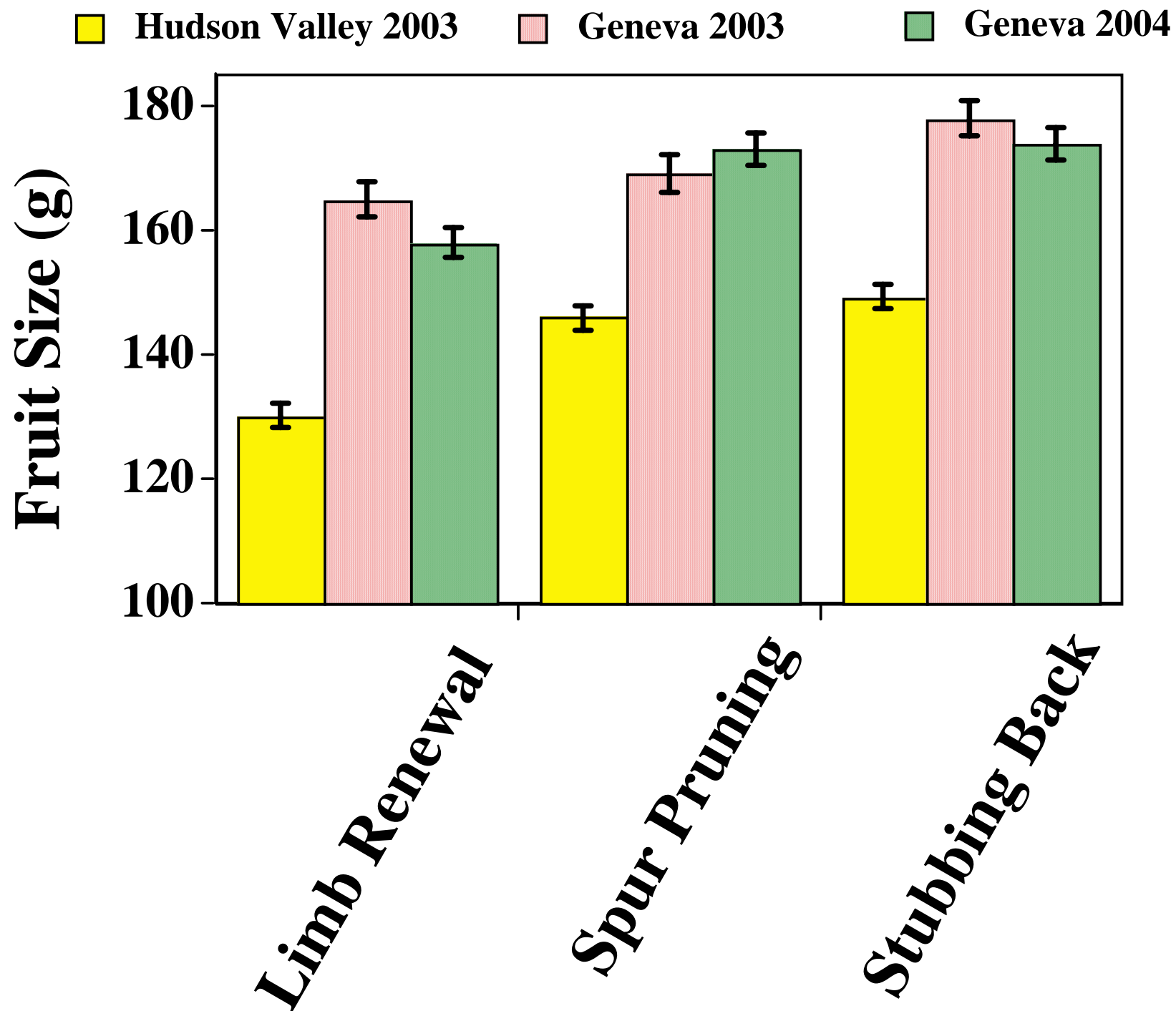
**Flower Cluster Density  
(Clusters/cm<sup>2</sup> TCA)**

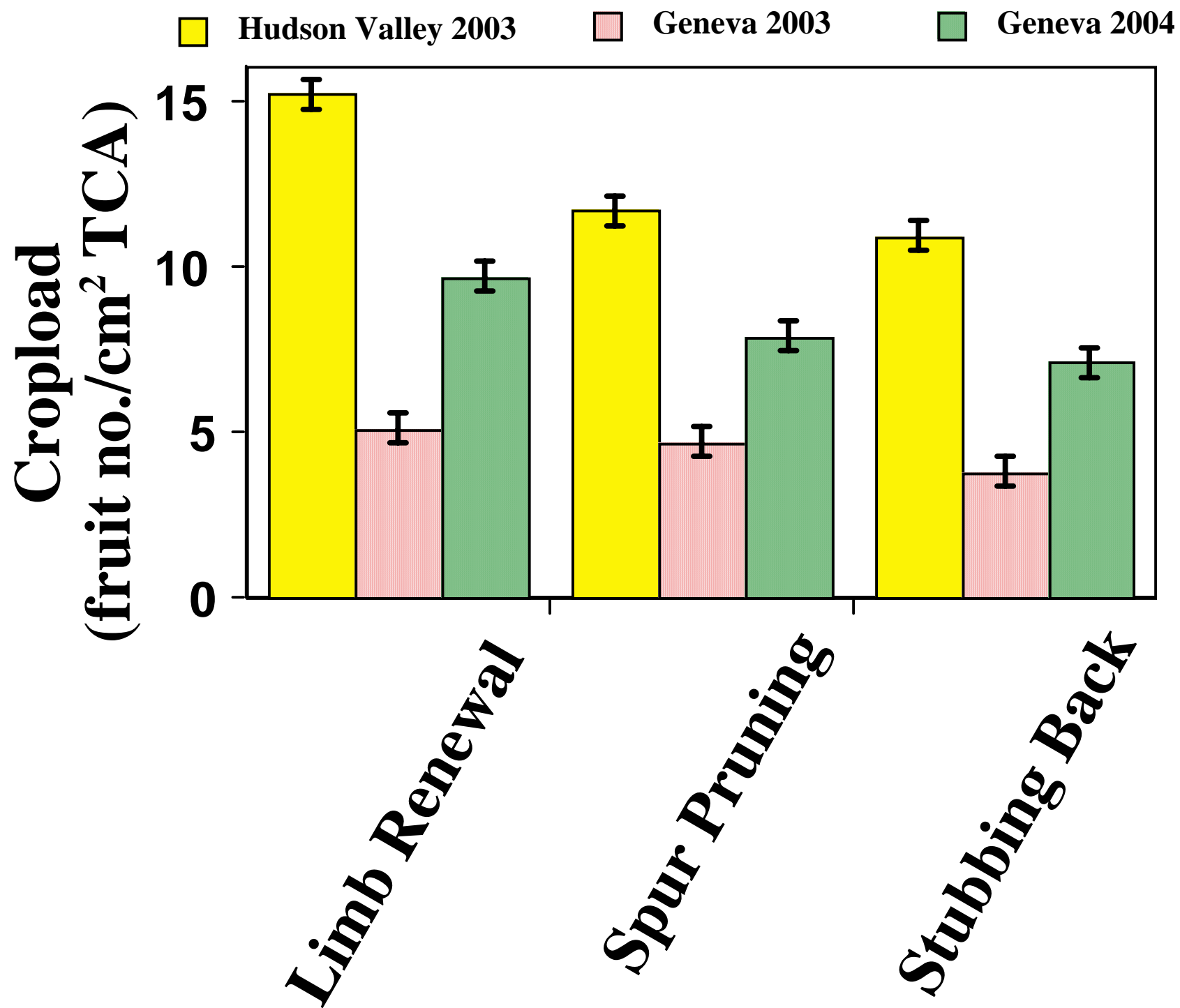


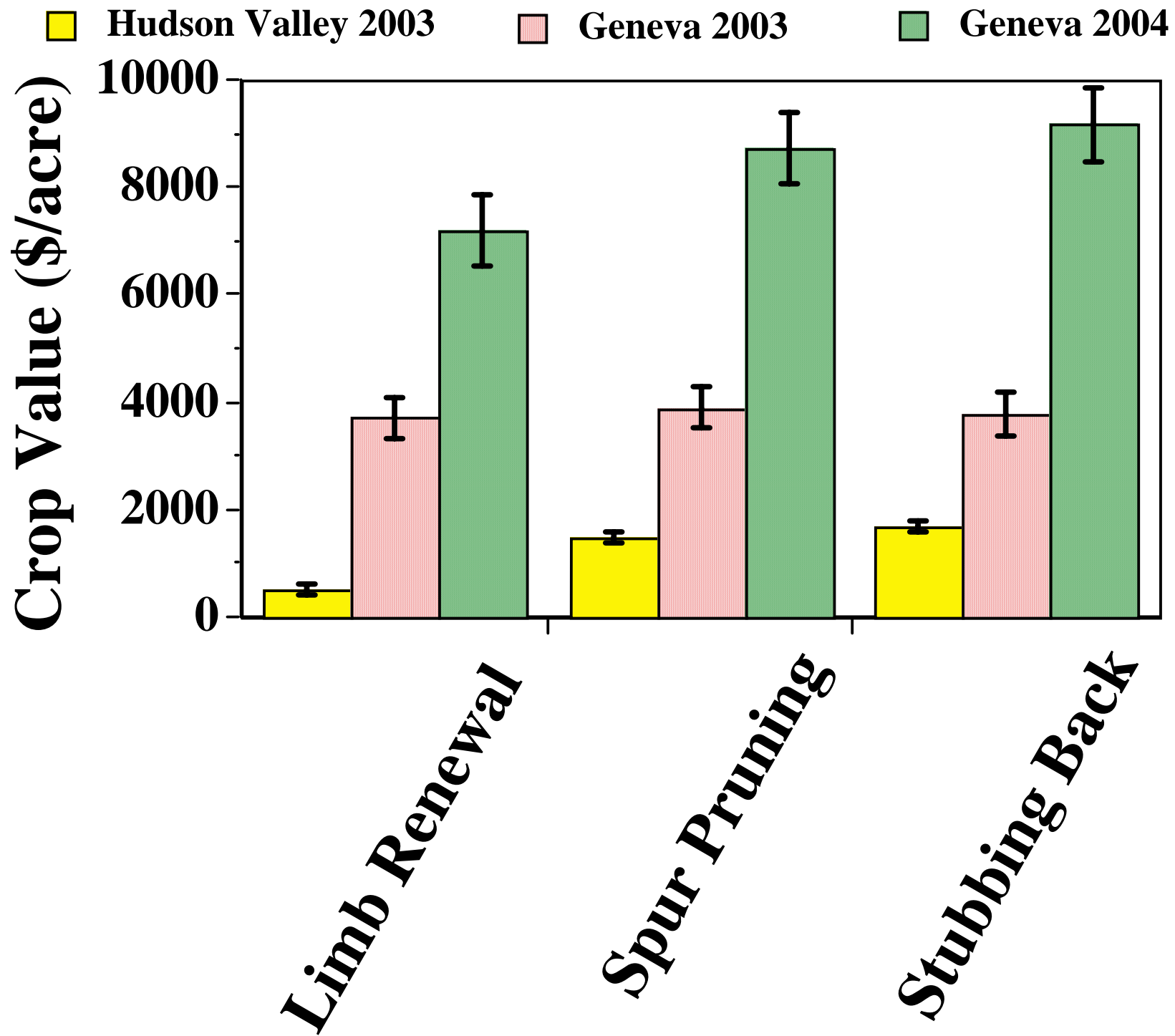


■ Hudson Valley 2003    ■ Geneva 2003    ■ Geneva 2004









# Fertilization Approaches to Improving Fruit Size

## • Nitrogen Fertilization.

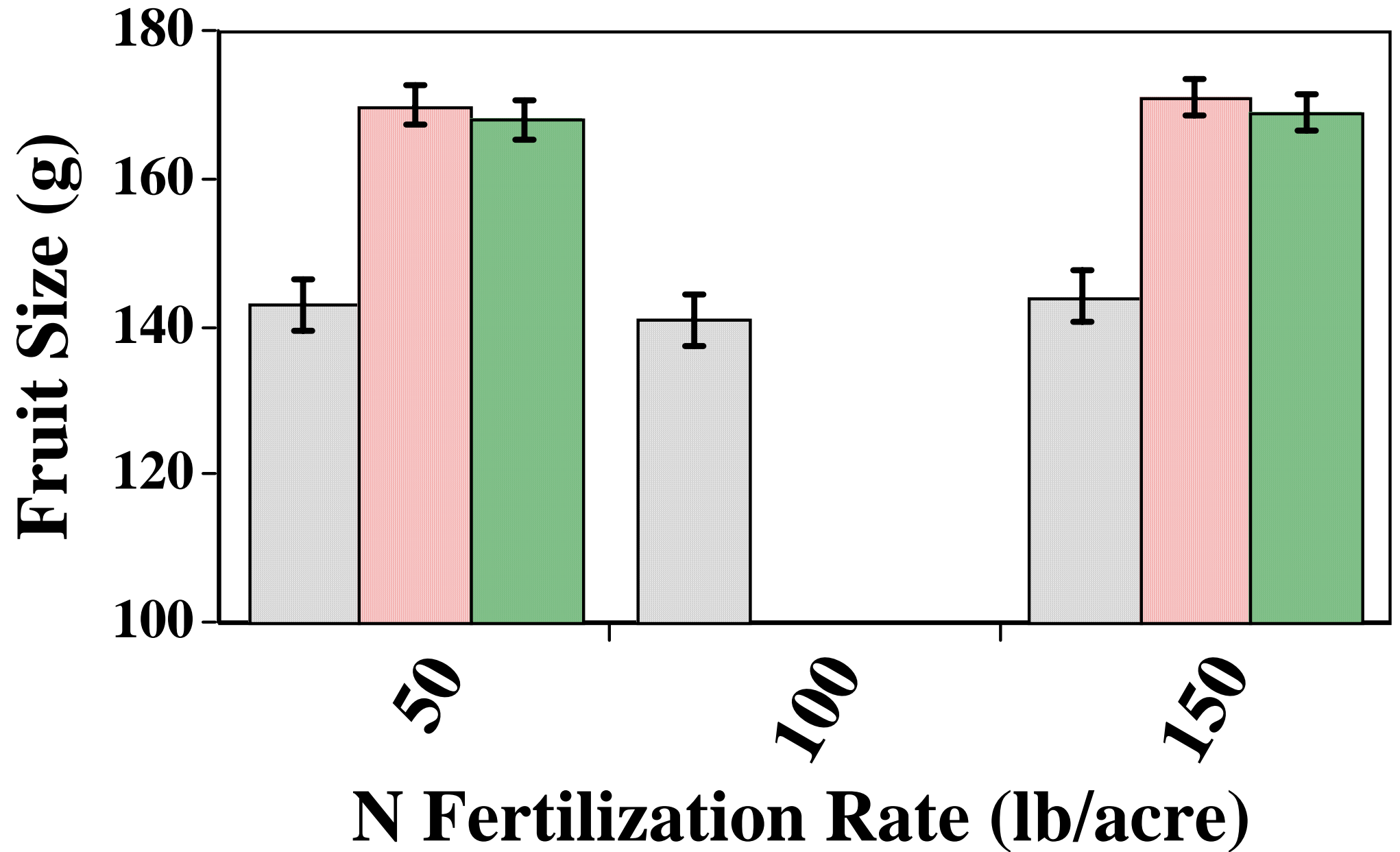
- 50 lb N/acre
- 100 lb N/acre
- 150 lb N/acre (bud break vs split bud break+petal fall)



■ Hudson Valley

■ Geneva 2003

■ Geneva 2004



# Fertilization Approaches to Improving Fruit Size

## • Nitrogen Fertilization.

- Yield generally increases with increasing nitrogen up to 2.6% leaf N but fruit color decreases with increasing leaf nitrogen concentration.

## • Potassium Fertilization.

- Yield and fruit size increase with increasing potassium up to 1.6% leaf  $K_2O$ .

# Thinning Approaches to Improving Fruit Size

## • **Bloom Thinning**

- Ammonium Thiosulfate (ATS)
- Promalin

## • **Petal Fall Thinning**

- Carbaryl
- Split applications of BA/Carbaryl

## • **10mm Thinning**

- NAA/Carbaryl
- BA/Carbaryl
- Split applications of BA/Carbaryl

# Effect of Various Thinners on Gala Fruit Size-2003

Thinning	Cropload	Fruit Size	Yield	Crop Value
Unthinned Control	15.7 a	139 b	2173 a	8203 b
0.5 NAA/Carbaryl	11.2 b	152 a	1797 b	9822 ab
100 BA/Carbaryl	10.2 b	162 a	1831 b	12059 a

## Effect of various additions

Promalin @ FB	NS	NS	NS	NS
ATS @ FB	NS	*	NS	NS
Carbaryl @ PF	NS	NS	NS	NS
Split Applications of BA	NS	NS	NS	NS

# Effect of Various Thinners on Gala Fruit Size-2004

Thinning	Cropload	Fruit Size	Yield	Crop Value
Unthinned Control	10.7 a	158 a	2477 a	15304 a
7.5 NAA/Carbaryl	7.4 b	170 a	2037 b	15388 a
100 BA/Carbaryl	9.4 ab	169 a	2296 ab	16468 a

## Effect of various additions

Promalin @ FB	NS	NS	NS	NS
ATS @ FB	NS	*	NS	**
Carbaryl @ PF	NS	NS	NS	NS
Split Applications of BA	*	**	*	NS

# **Best Thinning Strategies for Improving Gal**

## **Fruit Size**

### **2003**

- **2 gal ATS /100 @ Full Bloom + 1 pt Carbaryl/100 @ PF + 100ppm BA/Carbaryl @ 10mm fruit size. (av. size=185g)**
- **100ppm BA/Carbaryl @ 10mm fruit size. (av. size=162g)**

### **2004**

- **2 gal ATS /100 @ Full Bloom. + 1 pt Carbaryl/100 @ PF + 100ppm BA/Carbaryl @ 10mm fruit size. (av. size=191g)**
- **Promalin @ Full Bloom + 50ppm BA/Carbaryl @ PF + 50ppm BA/Carbaryl @ 7DAPF + 50ppm BA/Carbaryl @ 14DAPF. (av. size=194g)**

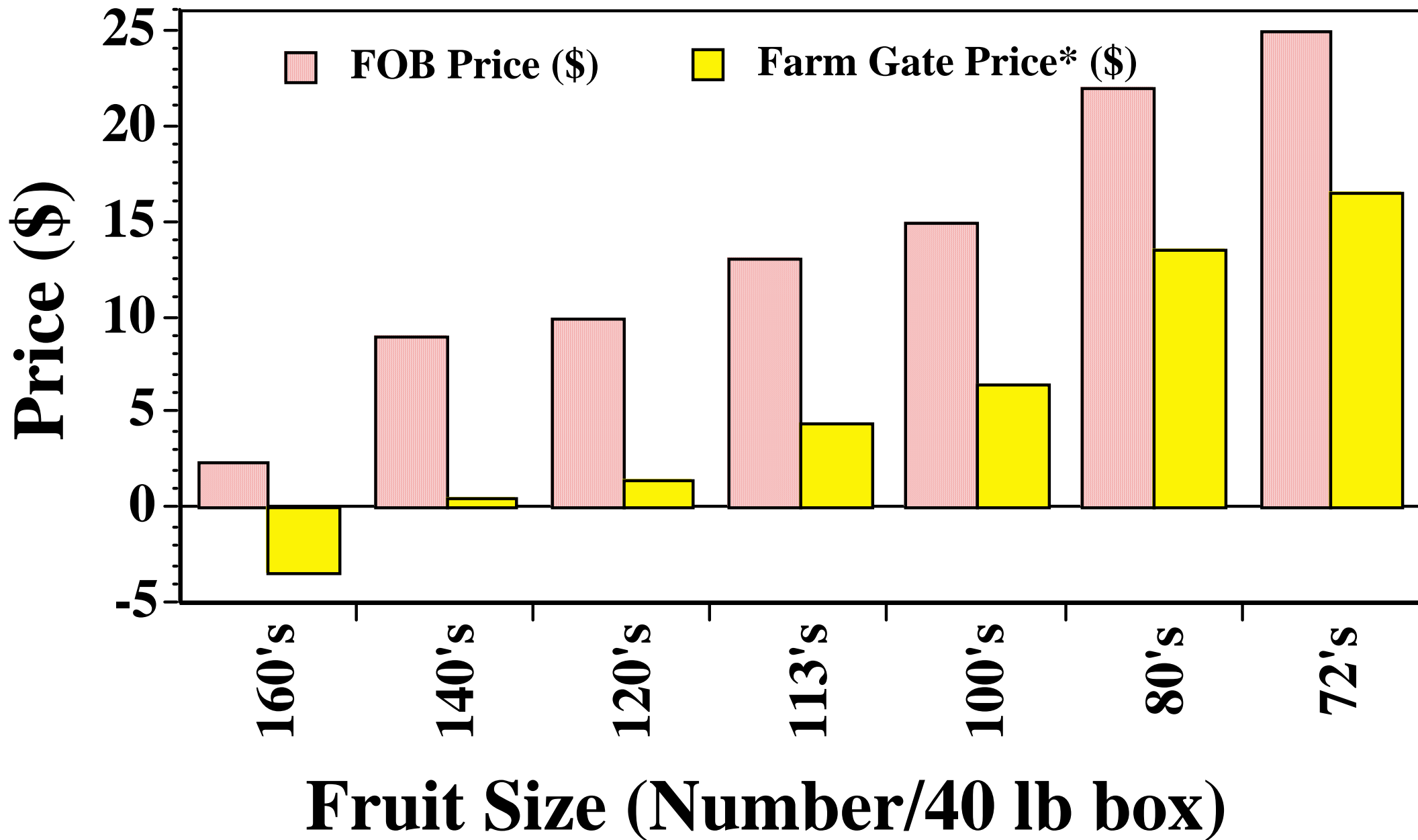
# Irrigation Approaches to Improving Fruit Size

- In the wet years like 2003 and 2004 there was no improvement in fruit size with irrigation.
- In dry years, irrigation gives a 5-10% improvement in fruit size.
- Trickle irrigation gives the same response as microsprinklers in most NY soils.

# What Fruit Size will Give the Greatest Returns to the Grower?

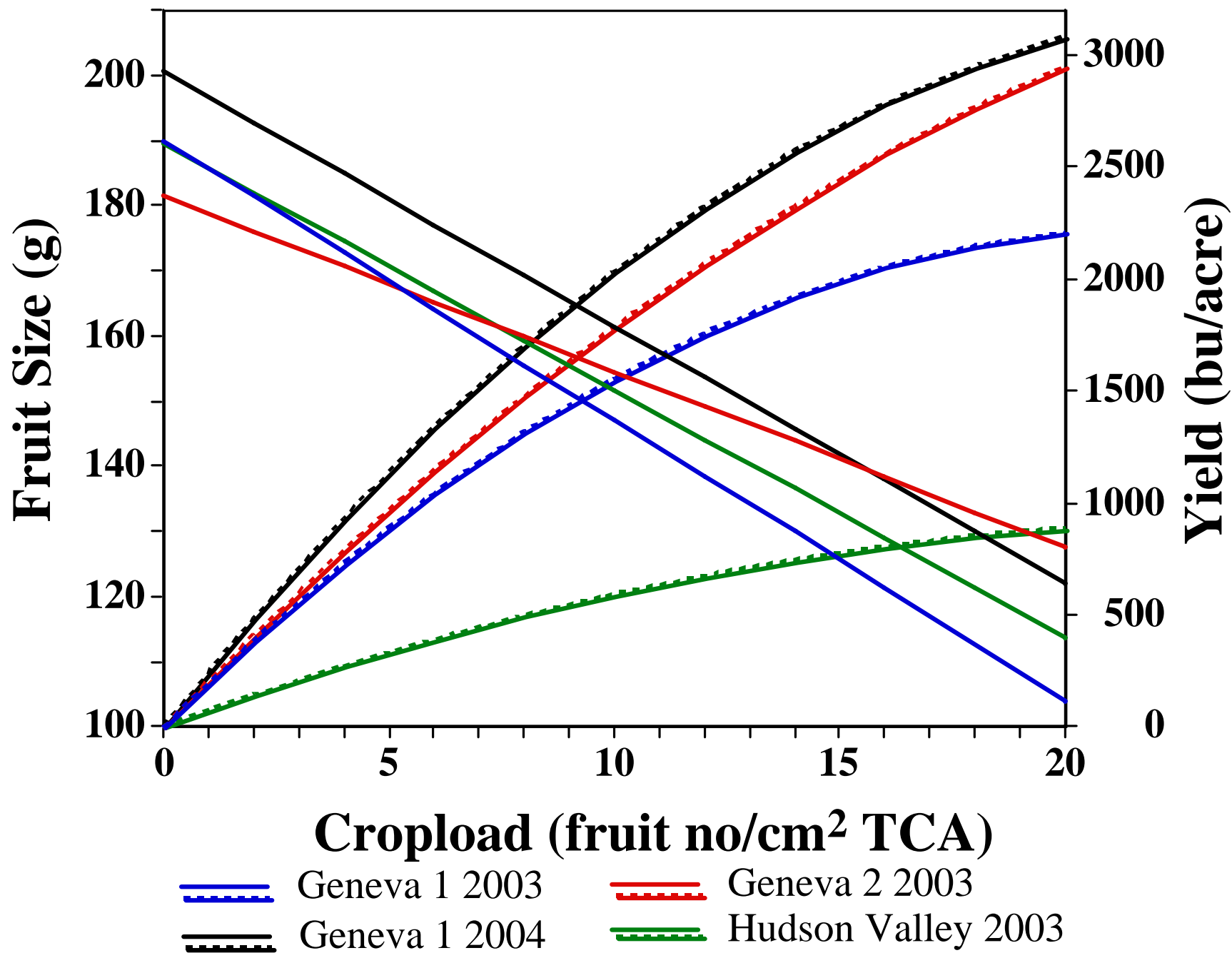
- 80 count fruit?
- 100 count fruit?
- 120 count fruit?
- Bag size fruit?



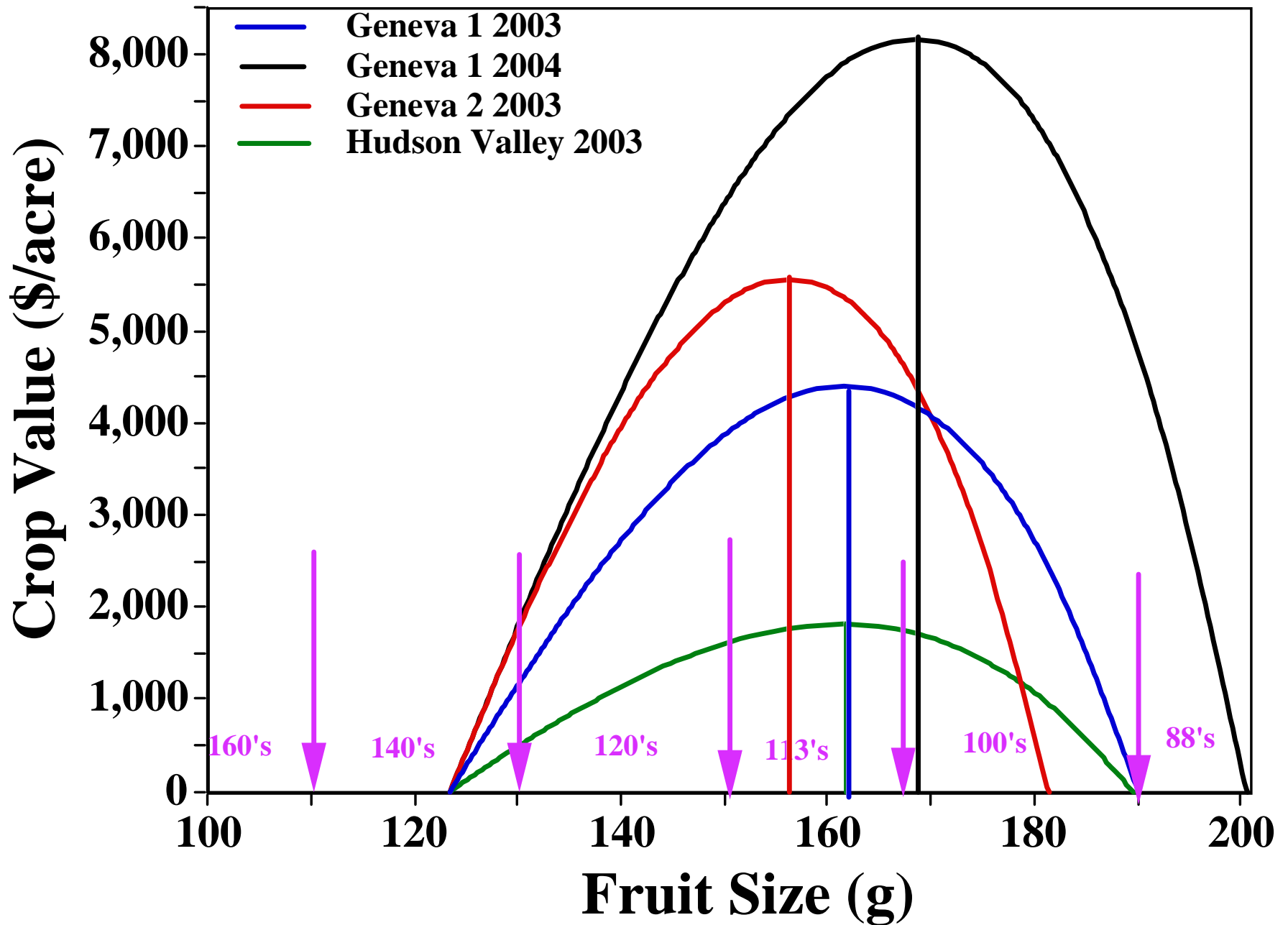


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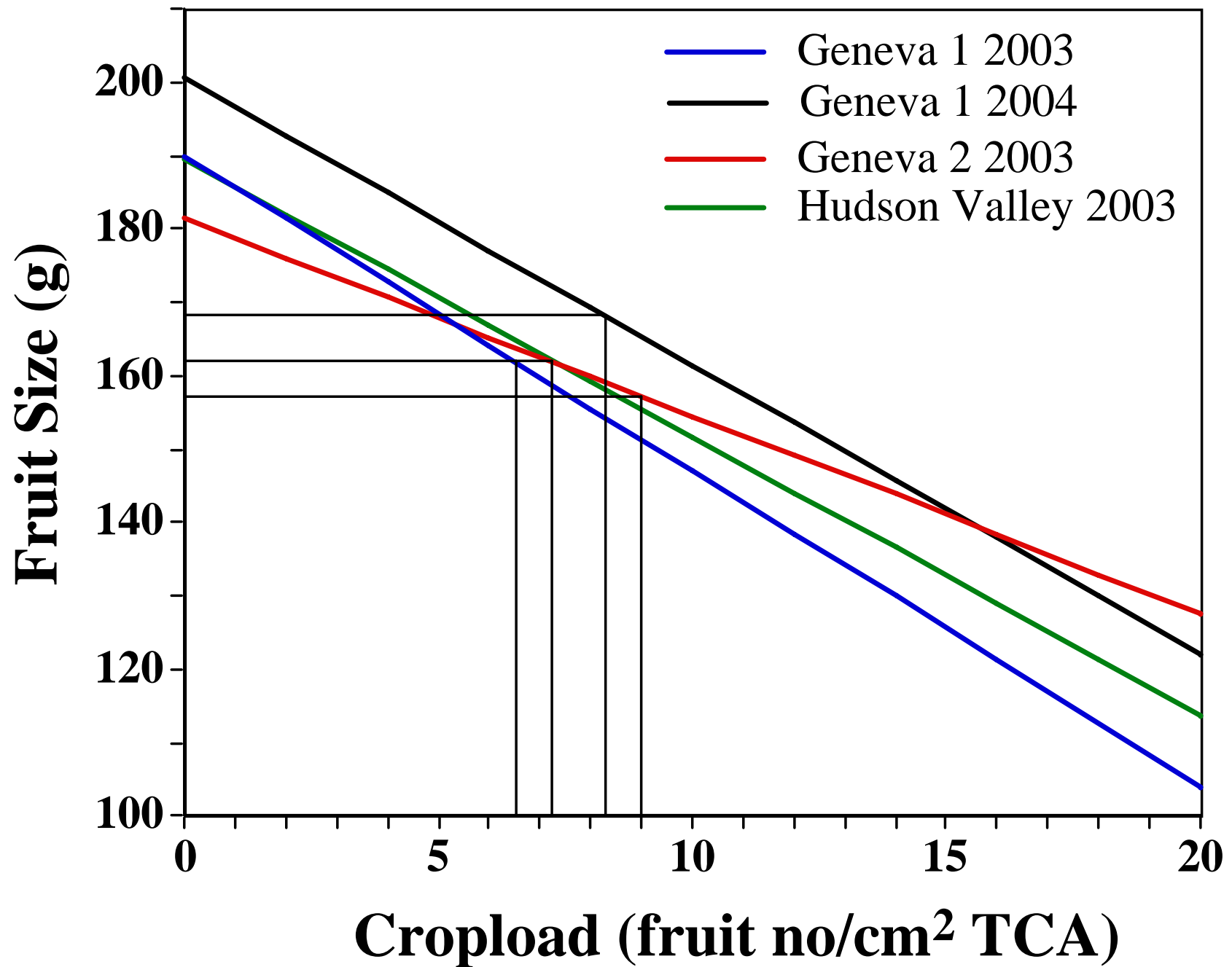
# Predicted Gala Fruit Size and Yield from 4 Plots in NY



# Predicted Farm Gate Crop Value with Different Average Fruit Size of 4 Gala Orchards in NY



# Predicted Gala Fruit Size from 4 Plots in NY



# Conclusions

- **The greatest returns to the grower came from high yields of moderate fruit size.**
- **Stubbing back pruning appears to be an effective way to increase fruit size for NY growers.**
- **Spur extinction also is an effective method of increasing fruit size.**
- **BA/Sevin has given the best improvements in fruit size with Gala. Multiple spray strategies have been the most effective.**
- **High Nitrogen fertilization has not improved fruit size.**
- **Irrigation can improve fruit size during dry years.**

Main Cornell Fruit Web Page

<http://www.fruit.cornell.edu>

NY Fruit Quarterly

<http://www.nysaes.cornell.edu/hort/fq>

