

# **Influence of Pruning and Training Systems on Apple Yields**

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# Introduction

- **Excessive vegetative growth in KY**
  - More leaves, fewer and/or smaller fruits
- **High-density planting**
- **Goal of every grower:**

**Early production and optimal fruit size**

# How to Achieve That Goal?

## Training

- Rootstock
- Training System

## Heading

- Limb angle

## Pruning

- Dormant
- Summer

# Purpose of this Project

Determine the best training and pruning practices needed to obtain early production and optimal fruit size

# Materials and Methods

- **Golden Delicious on M.9 rootstock**
- **Row spacing: 8 ft x 16.5 ft**
- **6.5 ft weed-free strip and sod alleyways**

# Materials and Methods

- **Block of 5 rows with 32 trees / row**
- **8 treatments and 5 replications**
- **Each replication: 4 trees, the middle 2 used for data collection**
- **Total number of trees = 160**

# Materials and Methods

- RCBD design with 2 factors:  
Training X Pruning
- 2 Training systems:  
French Axe or Slender Spindle
- 4 Pruning Systems:  
Light-weekly, moderate-bimonthly,  
moderate-weekly, heavy-weekly

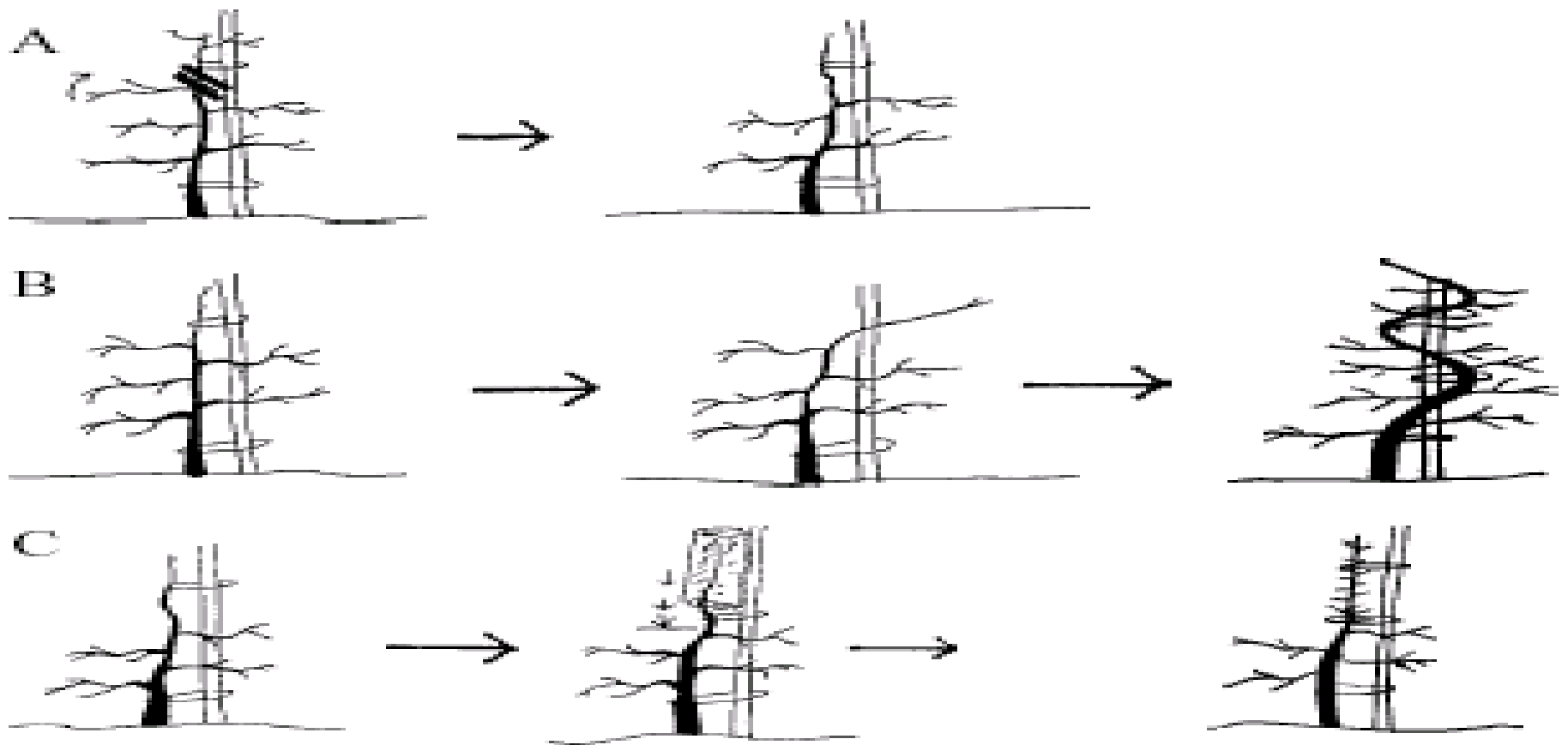
# Pruning Systems

	Leader Heading	Limb Angle	Limb Management
Light – Weekly	No	45°	No
Moderate – Bimonthly	Yes	45-60°	Yes
Moderate - Weekly	Yes	45-60°	Yes
Heavy - Weekly	Yes	60-90°	Yes



# Pruning Systems

	Leader Management		
(FA / SS)	1997-1998	1999	2000-2002
Light - Weekly	Bag	Bend Renewal	12 ft 9 ft
Moderate - Bimonthly	Bend	Bag/Bend Snaking	11 ft 9 ft 'Y'
Moderate - Weekly	Bend	Bend Snaking	11 ft 9 ft 'Y'
Heavy - Weekly	Head	Bend Bag	10 ft 9 ft 'Z'



**Figure 2. Leader management techniques**

- A. Weak leader removal
- B. Snaking
- C. Bagging

Courtesy of: Horticulture Information Leaflet 360  
**HIGH DENSITY APPLE ORCHARD MANAGEMENT TECHNIQUES**

M. L. Parker, Tree Fruit Extension Specialist and C. R. (Dick) Unrath,  
 Professor, Department of Horticultural Science, N.C. State University



















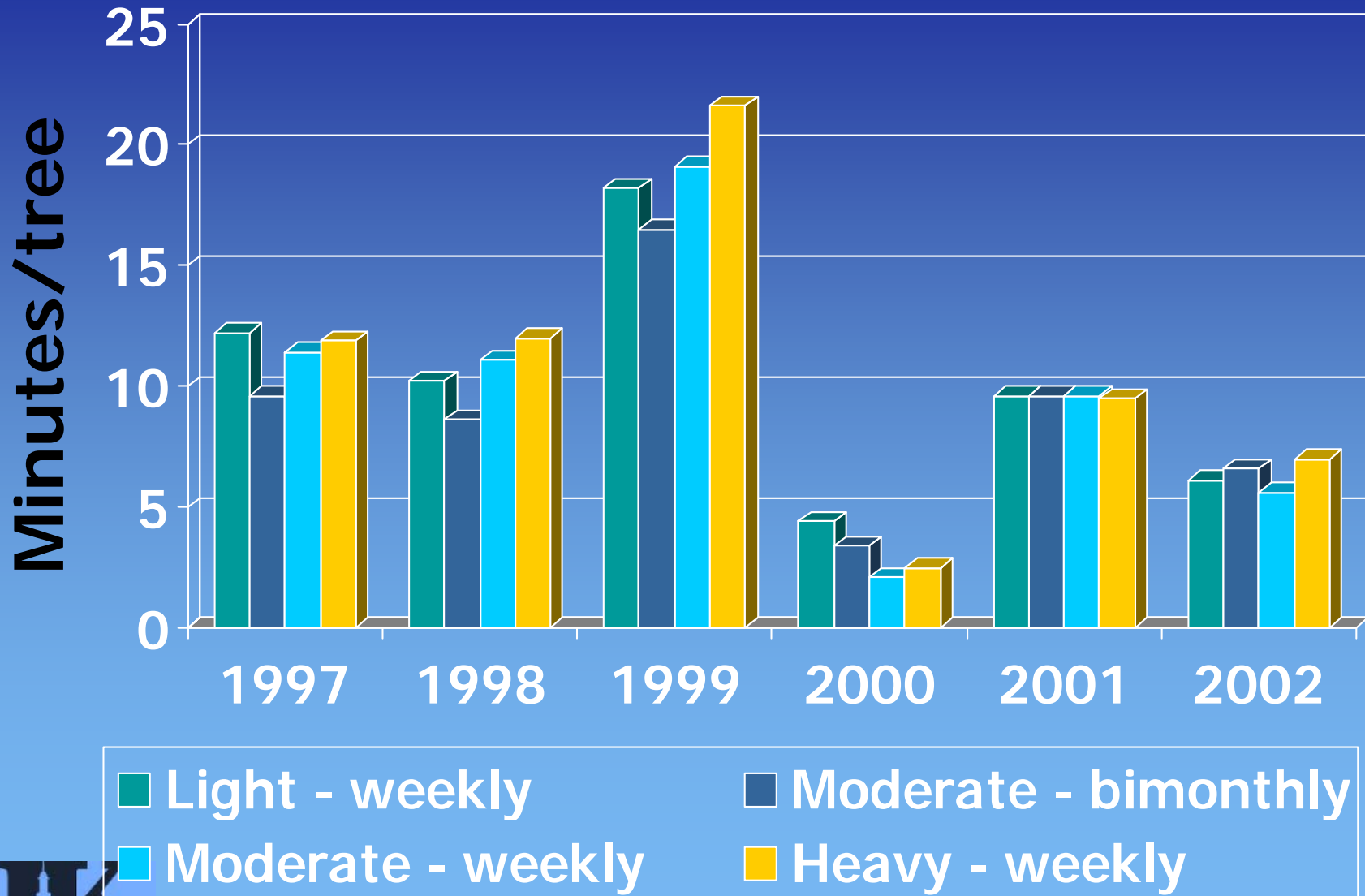


## Results

- **No differences were observed between French Axe and Slender Spindle training systems.**
- **Data presented in the following slides show the combined values of the 2 systems.**



# Time required for pruning & Training



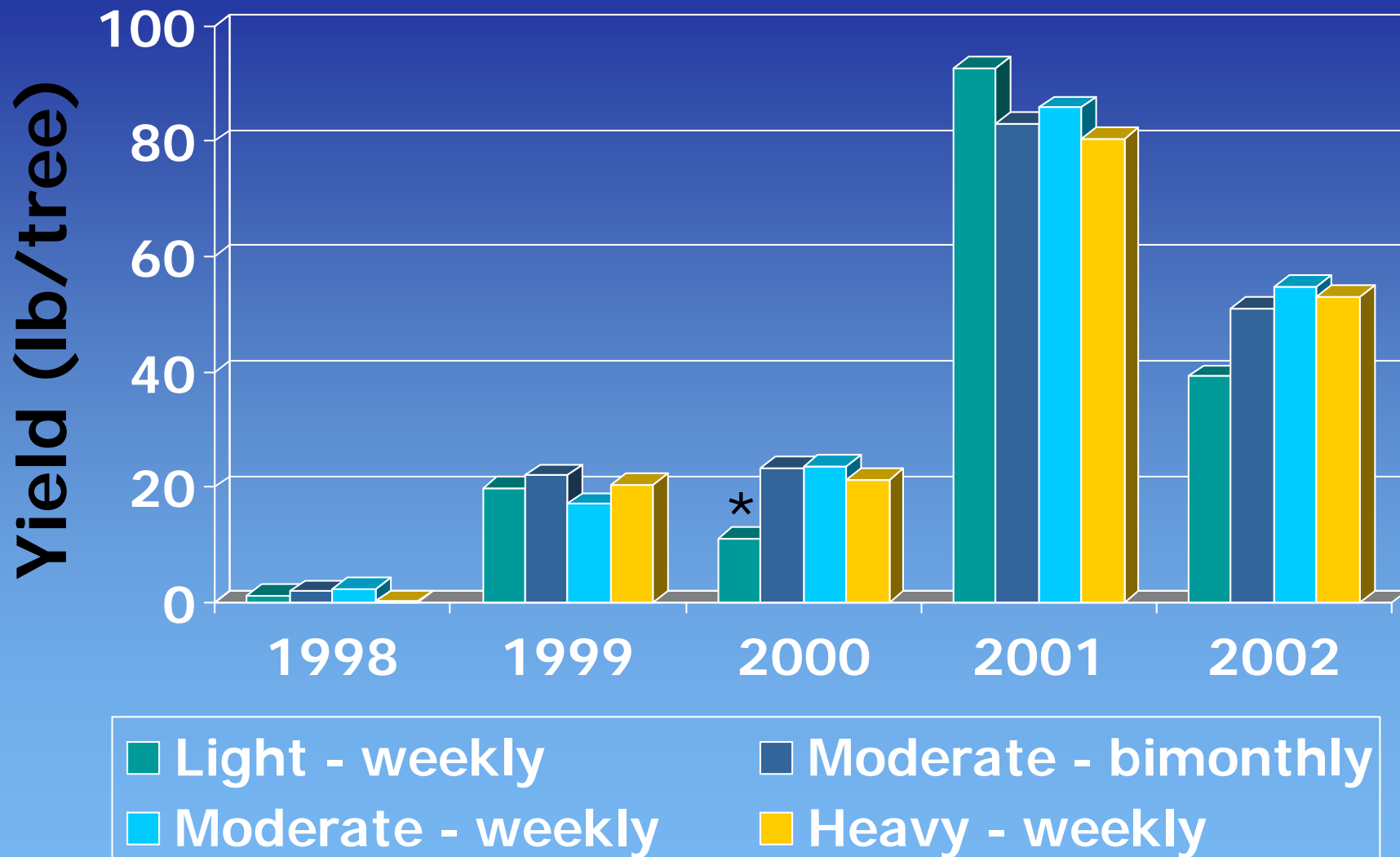
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## Time required for pruning & Training

	Total Minutes per tree	Minutes per lb of fruit
Light – Weekly	60.7	0.36
Moderate – Bimonthly	54.3	0.30
Moderate – Weekly	58.9	0.33
Heavy - Weekly	64.5	0.36

# Yield



# Yields in 2002

Pruning Level	Fruit Weight (oz)	Cumulative Yield (lb)
Light – weekly	5.46	167.0
Moderate – bimonthly	5.36	179.8
Moderate – weekly	5.04	180.4
Heavy – weekly	5.41	177.3
Mean	5.33	176.0
LSD (5%)	NS	NS

# Which shows the least amount of time spent managing the tree?

2002 Yield:  $6 \pm 3$  lb

2002 Yield:  $27 \pm 25$

Cumulative Yield:  $72 \pm 8$

Cumulative Yield:  $86 \pm 16$



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