

High Density Pears: Profitable for You not Just for Your Heirs

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Pear Growing Systems Around the World

- New York State - Central leader system at densities of 100-200 trees/acre.
- California - Multiple Leader system at densities from 100-200 trees/acre.
- Oregon/Washington - Central Leader system at densities from 100-350 trees/acre.
- Europe - Tall Spindle and Super Spindle on Quince rootstock at densities from 1,000-4,000 trees/acre





The Challenges with Pears in NY

- Slow to begin production (Plant pears for your heirs)
- Low Mature Yields - Apples have higher yields thus most growers choose to plant apples.
- Small fresh market and unstable processing market.
- Fire blight
- Pear Psylla



Solutions to Problems with Pear in NY

- High Density systems can have higher early yield and higher mature yield.
- New improved rootstocks can improve precocity and reduce tree size.
- New varieties with fire blight resistance or new varieties for high priced market niches.



NY Pear Systems Trial

- A 4 acre field trial was planted at Geneva, NY in 2003.
- 4 Varieties (Bartlett, Bosc, Taylors Gold Comice, Concorde).
- 5 Rootstocks (seedling, OHF97, OHF87, Pyrodwarf, Pyro 2-33, Quince A)
- 4 training systems were used ranging in density from 242-2,178 trees/acre.

System	Tree Den. (trees/acre)	Spacing (ft)	Initial Heading Height (inches)
Central Leader	242	10 x 18	32
Vertical Axis	519	6 x 14	48
Tall Spindle	908	4 X 12	60
Super Spindle	2178	2 x 10	60

Traditional Central Leader

- Spacing 10X18'
- Conduit support pole but no trellis
- Leader headed each year
- Branches tied down to 45° in third year.



Vertical Axis

- Spacing 6 X 14'
- Conduit support pole and single wire trellis.
- Leader headed at planting.
- Branches tied down to 90° at end of second year.
- Large branches removed with a bevel cut.



Tall Spindle

- Spacing 4 X 12'
- Conduit support pole and single wire trellis
- Leader not headed at planting.
- Branches tied down below horizontal (135°) at the end of the second year.

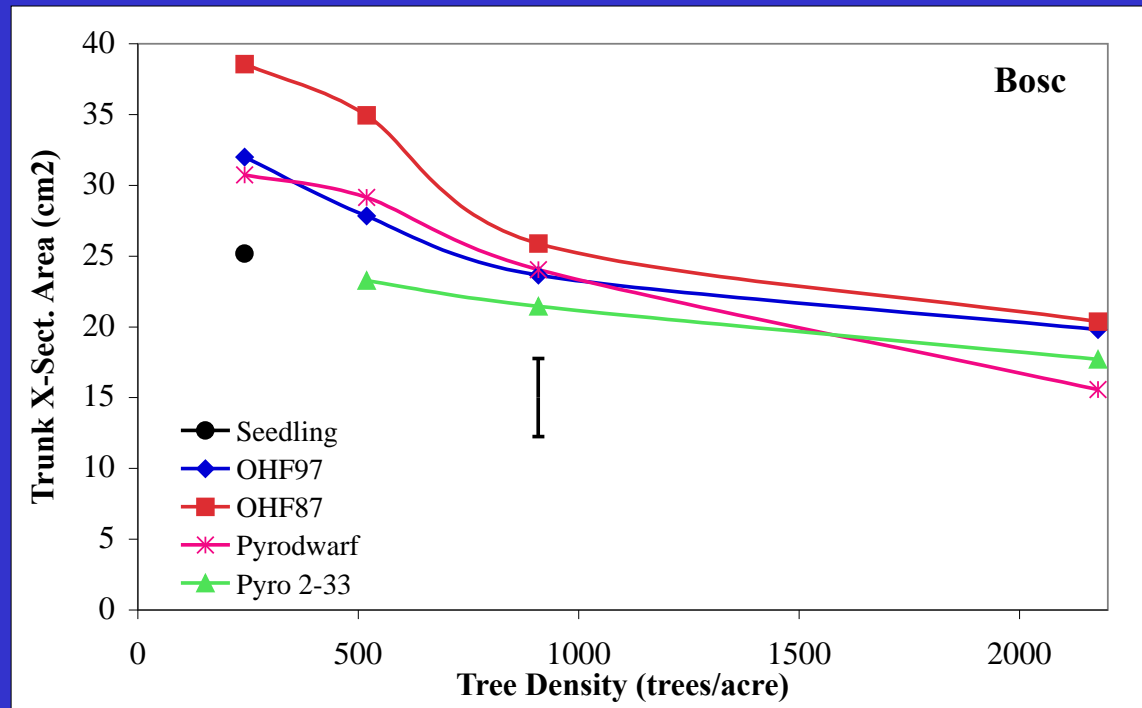
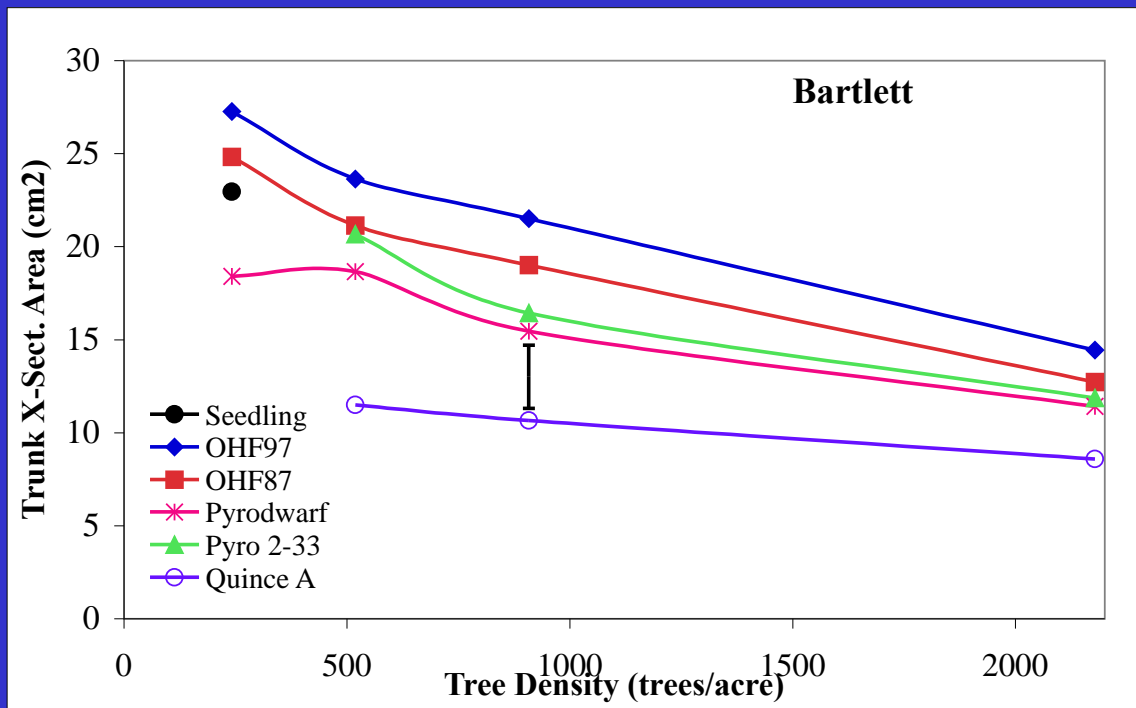


Super Spindle

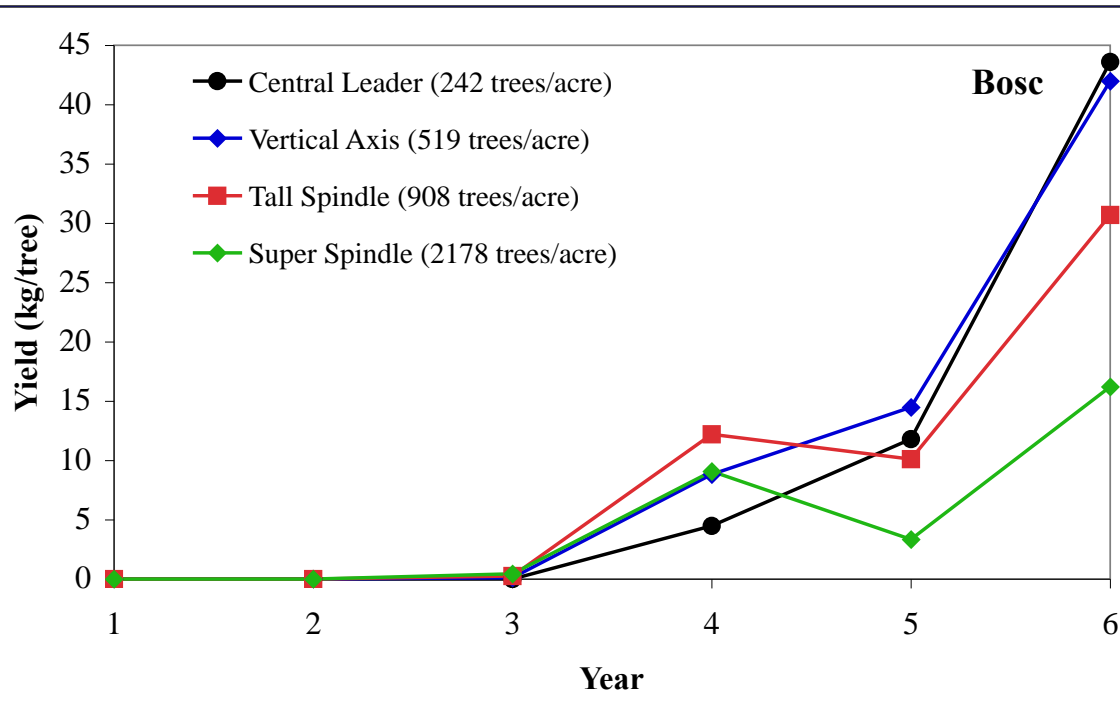
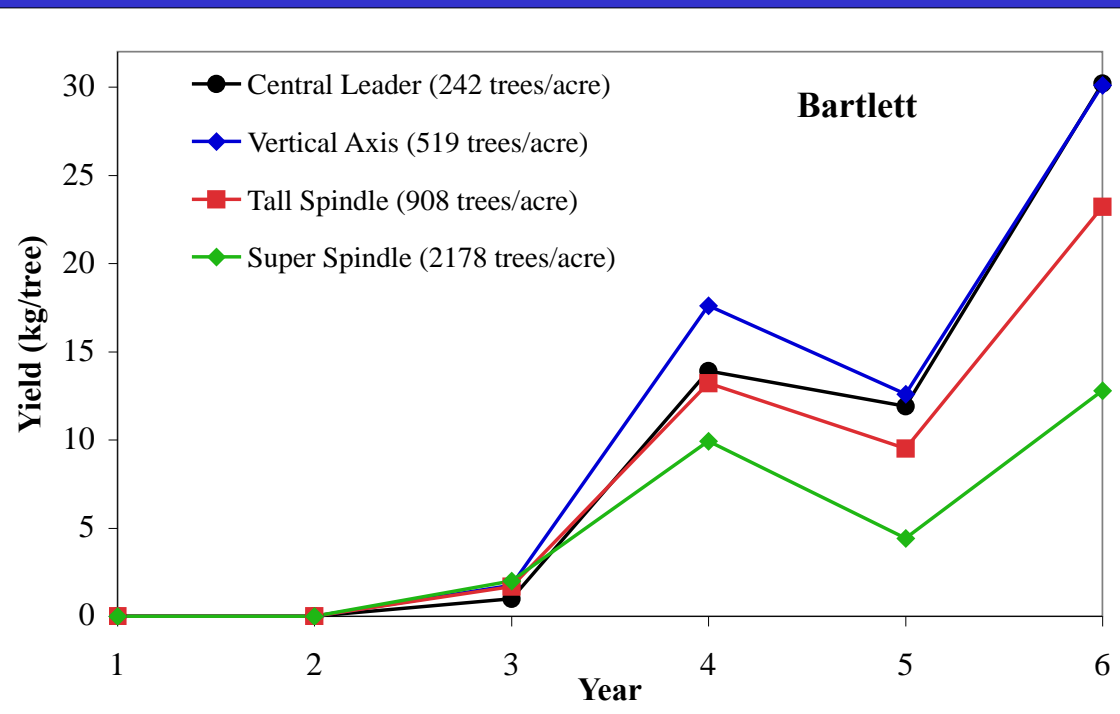
- Spacing 2 X 10'
- Leader not headed at planting.
- Branches tied to trellis wire in first and second year.
- Large branches removed with a bevel cut.
- Fruitful branches shortened to fit into space.



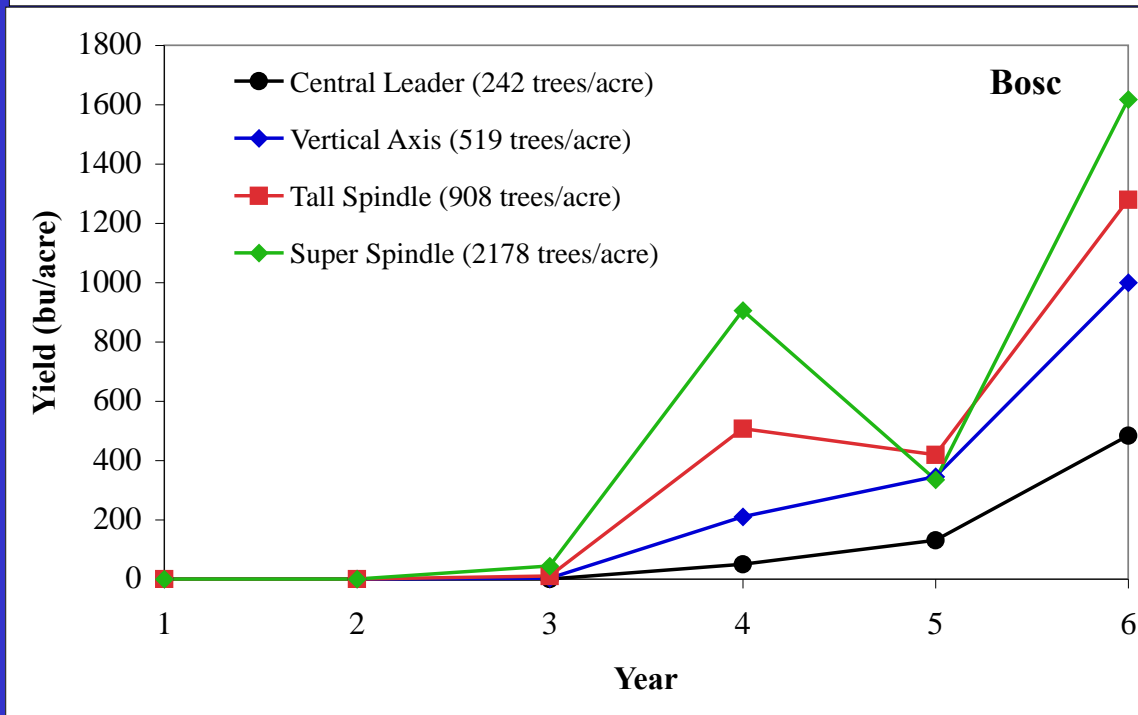
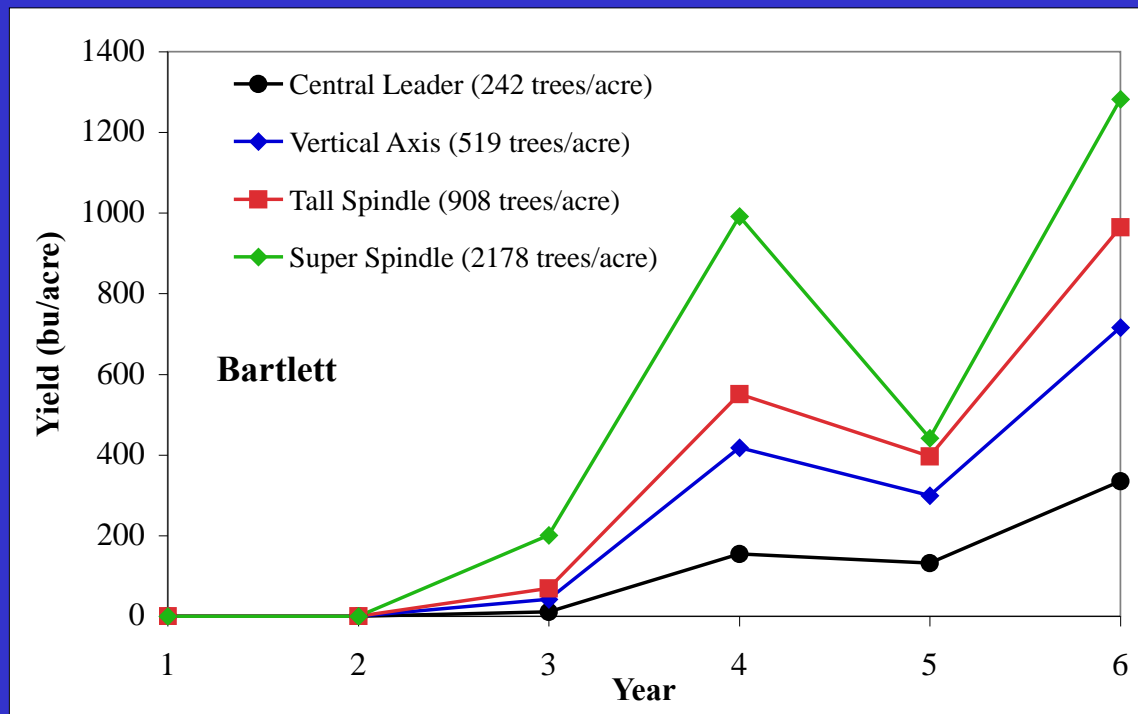
Effect of Planting Density on Tree Size



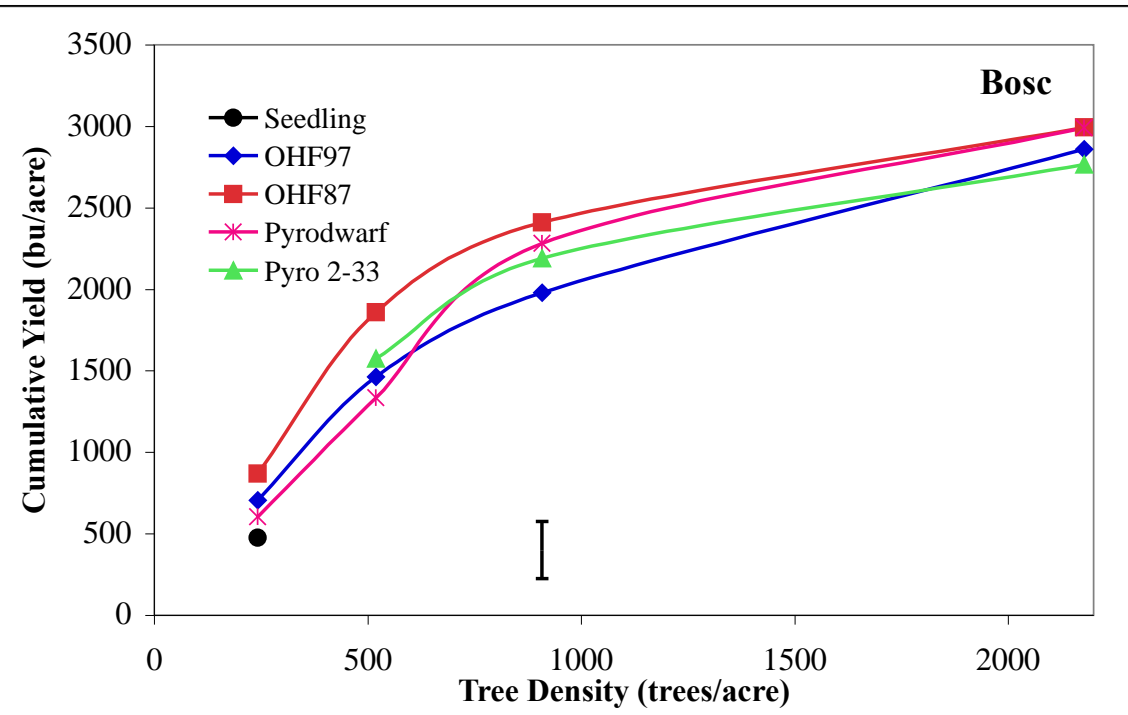
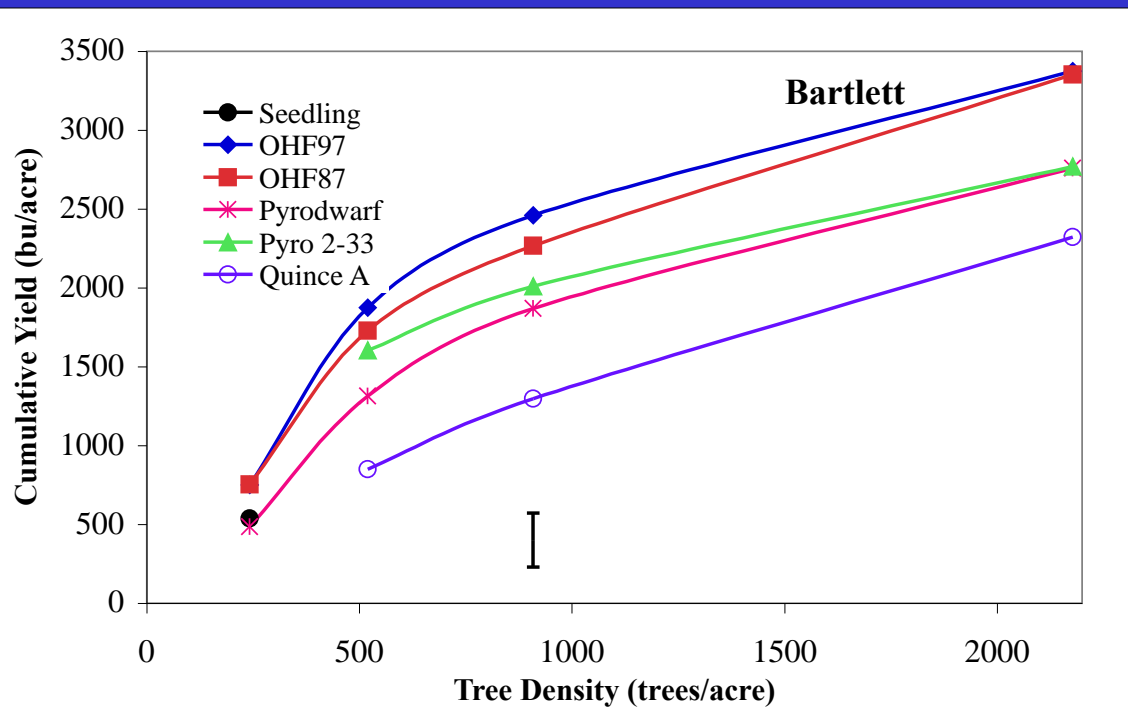
Effect of Training System on Yield /tree



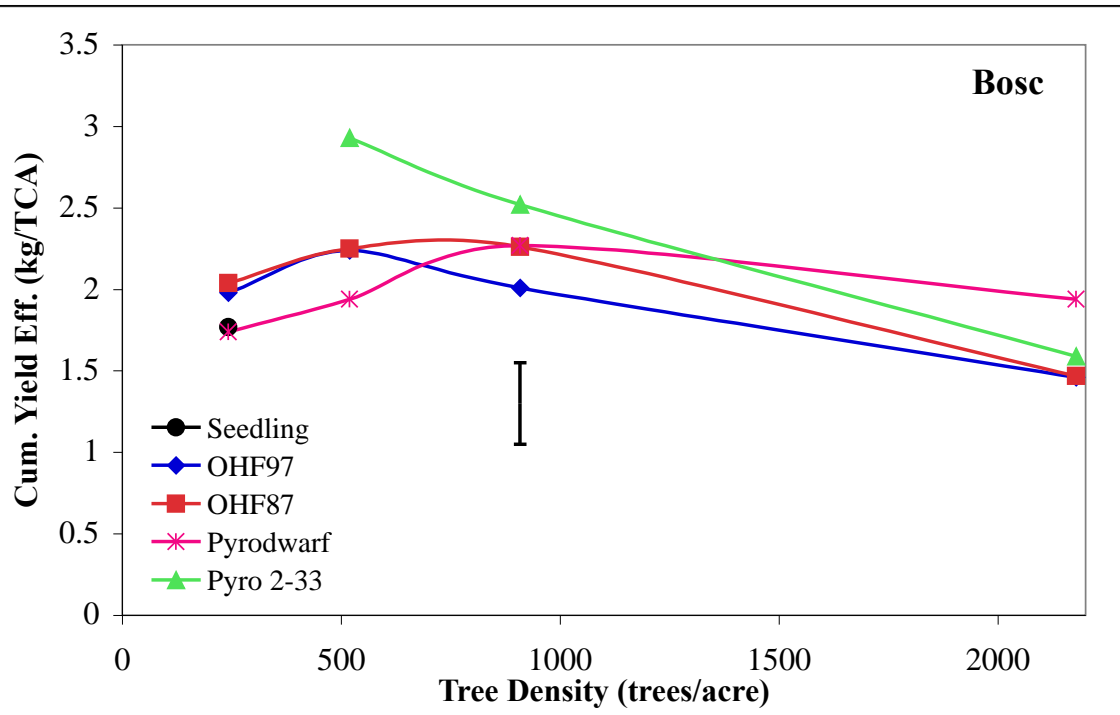
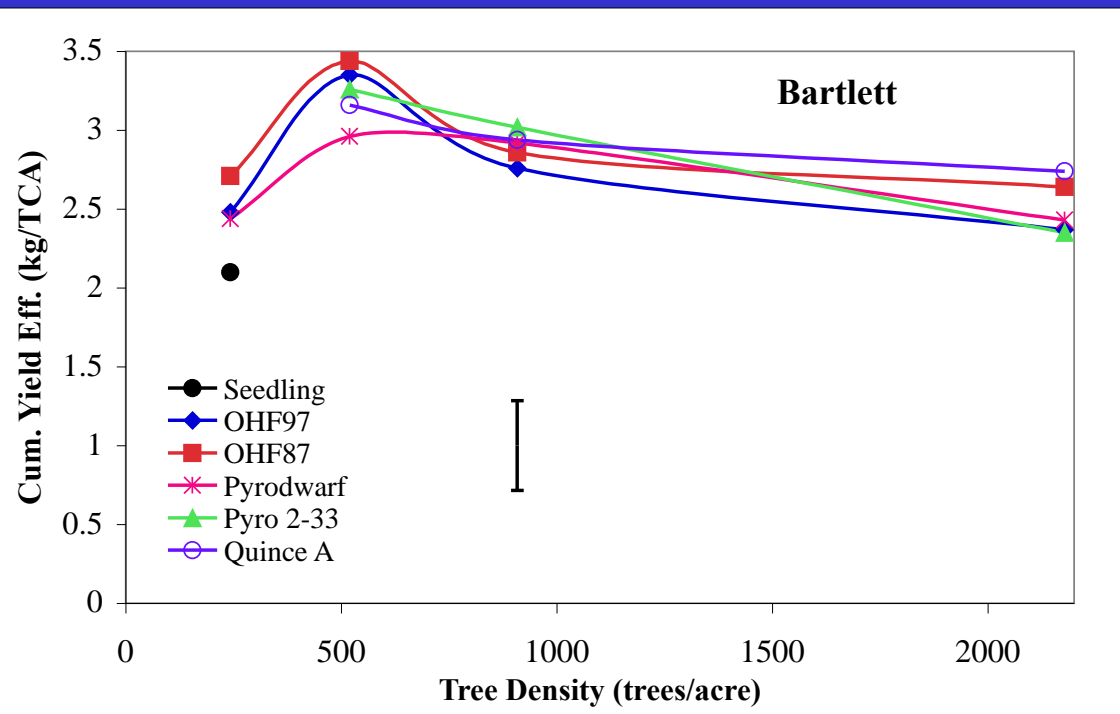
Effect of Training System on Yield /acre



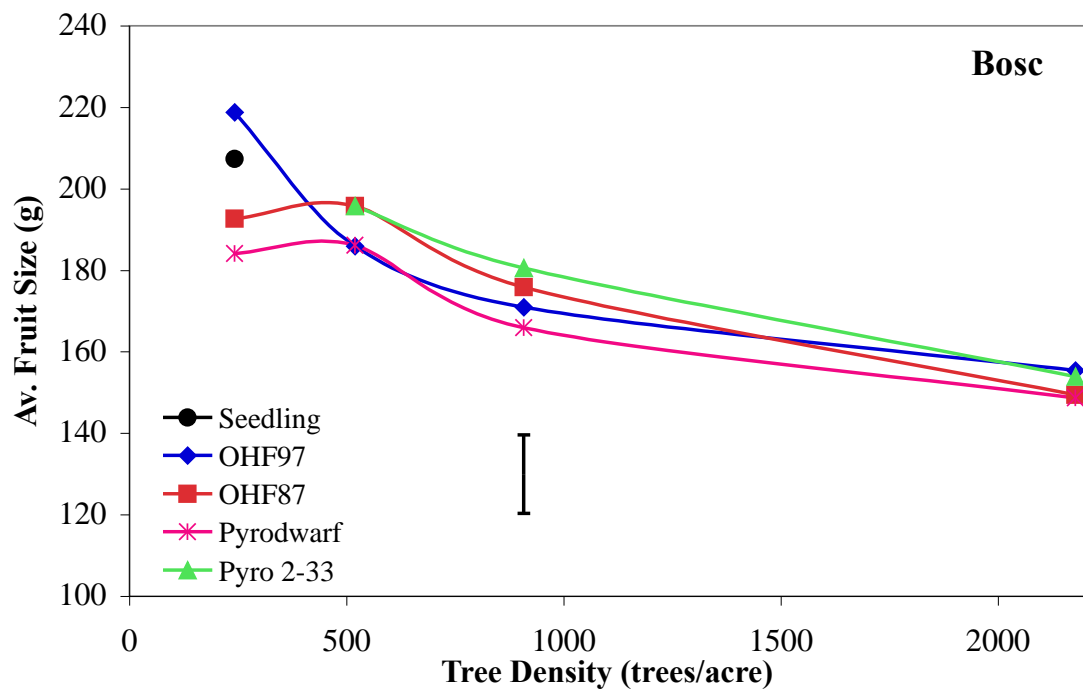
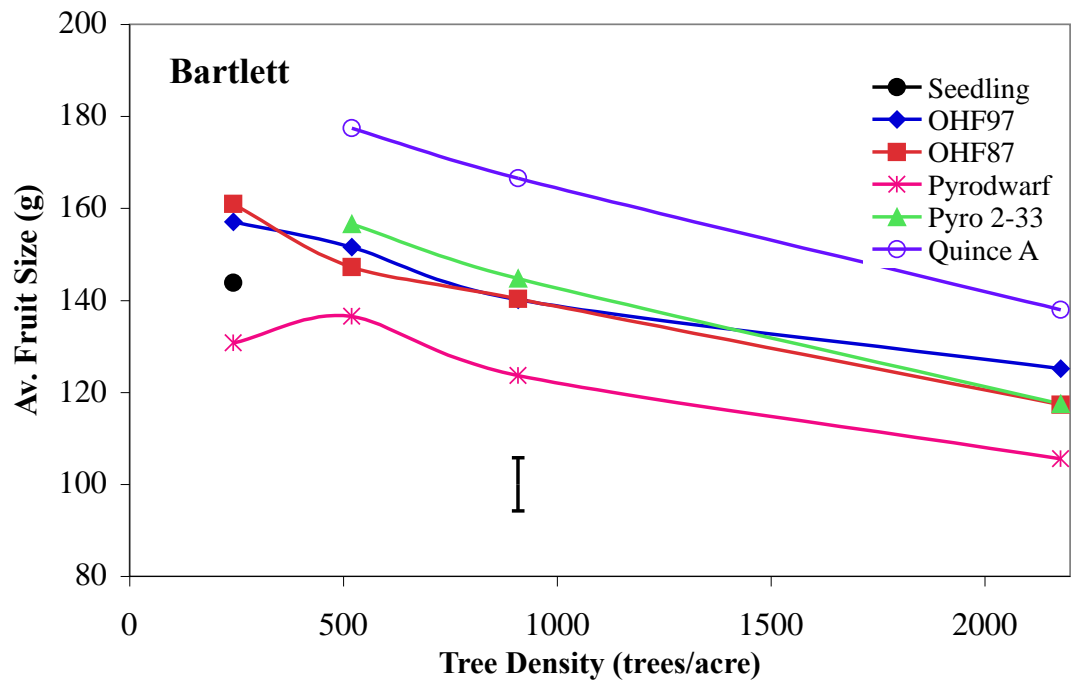
Effect of Training System on Yield /acre



Effect of Planting Density on Yield Efficiency



Effect of Planting Density on Average Fruit Size



Conclusions

- Tree density had a mild dwarfing influence on tree size. The highest density systems had trees about 60% the size of the lowest density system after 5 years.
- Tree density had a strong positive influence on yield. The Super Spindle was 5 times as productive as the traditional Central Leader system which was the least productive.
- Increasing tree density resulted in smaller fruit size.
- Long-term manageability with Super Spindle is questionable without root pruning or growth inhibitors
- The best option appears to be the Tall Spindle (4')



Options for NY Pear Growers: Tall Spindle

- Spacing: 4 X 12-14'
- Rootstock: OHF 87
- Trellis: Three wire trellis with stabilizer wire
- Pruning: Leader not headed at planting, then branch renewal.
- Branches tied down below horizontal (135°) early in the second year.



Options for NY Growers: Bi-Axis, Tri-axis

- Spacing: 4 X 12-14'
- Rootstock: OHF 87, Pyro2-3
- Trellis: Four wire trellis
- Two leader tree from nursery or
- Develop second leader in orchard
- Pruning: Leader not headed at planting, then branch renewal.
- Fruiting Wall
- Short fruiting branches.





Options for NY Growers: Bi-Axis, Tri-axis

- Spacing: 4 X 12-14'
- Rootstock: OHF 87 or Sydo Quince
- Trellis: Three wire V-trellis
- Four leader tree from nursery or
- Develop four leader in orchard
- Pruning: Leader not headed at planting, then branch renewal.
- Short fruiting branches.



Options for NY Growers: Traditional Varieties or New Fire blight Resistant Varieties

- Bartlett, Bosc, Anjou, Comice
- Harrow Crisp, Harrow Sweet, Sundown
- Blake Pride, Potomac, Magness
- New USDA varieties

