

Pecan Production 101:
Sunlight, Crop Load
Management, Pollination

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Effect of Shading on Pecan Trees

- Sunlight is the most limiting factor in most Georgia pecan orchards
- Nut production is limited by the trees' ability to absorb solar radiation
- Intensifies alternate bearing and results in poor quality during the “on” year



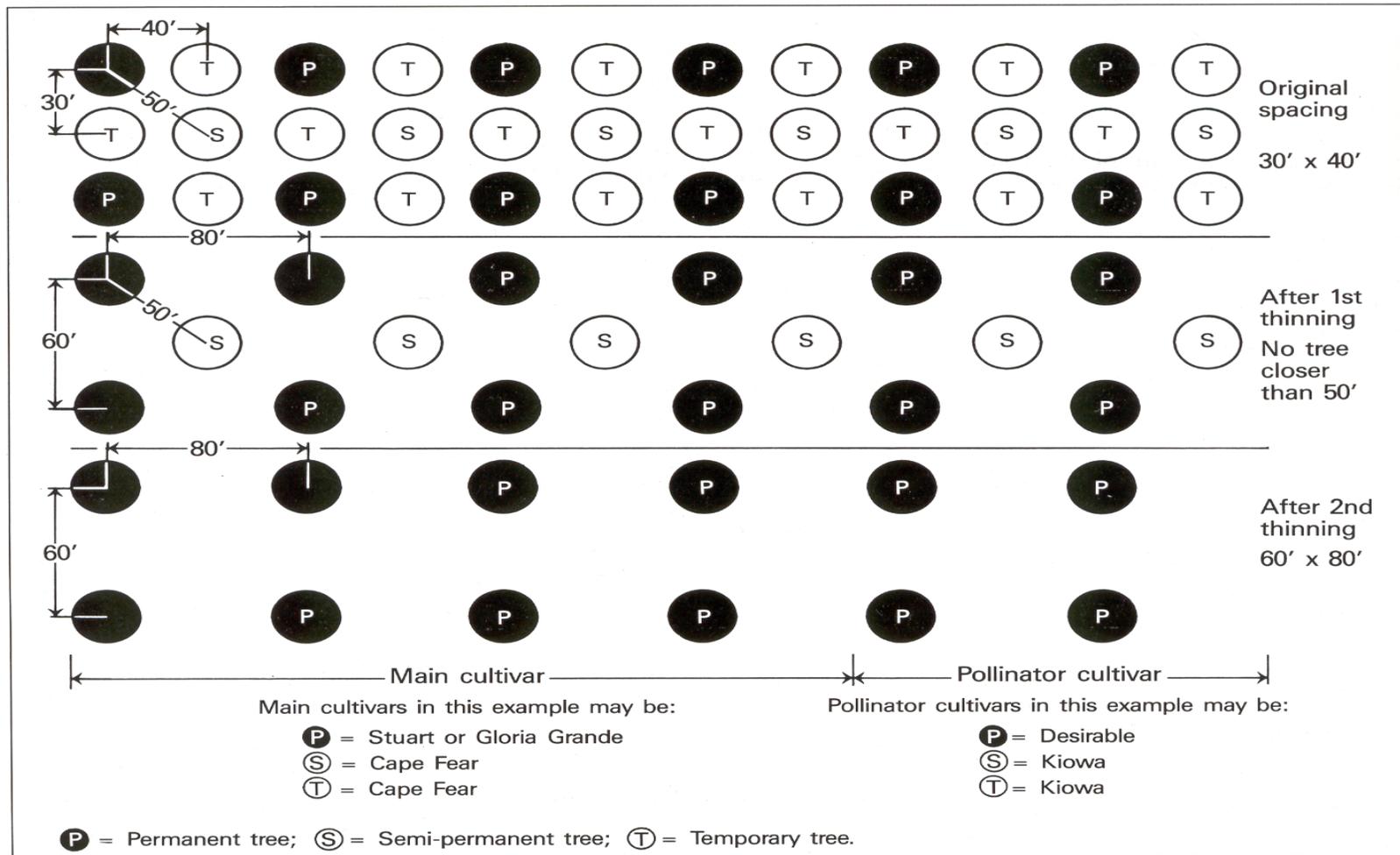
Sunlight:

When to thin the orchard?

- Thin trees when 60% of orchard floor is shaded
- Usually between 15-22 years for young orchards

Trees Planted	Need Canopies less than	Driplines should be:
35X35	28 ft diameter	7 ft apart
40X40	32 ft diameter	8 ft apart
50X50	40 ft diameter	10 ft apart
60X60	48 ft diameter	12 ft apart
70X70	56 ft diameter	14 ft apart

Thinning on the Diagonal



Trees within an orchard vary

- Wood (1989) selected 21 'Stuart' trees about 80-years-old at random from a Georgia orchard and kept up with yields of individual trees for 6 years.
- The best tree averaged 328 lbs. per year, the worst tree averaged 26 lbs., a 12-fold difference.
- 12 of the 21 trees were "superior", that is they were above average both in yield and regularity of bearing.

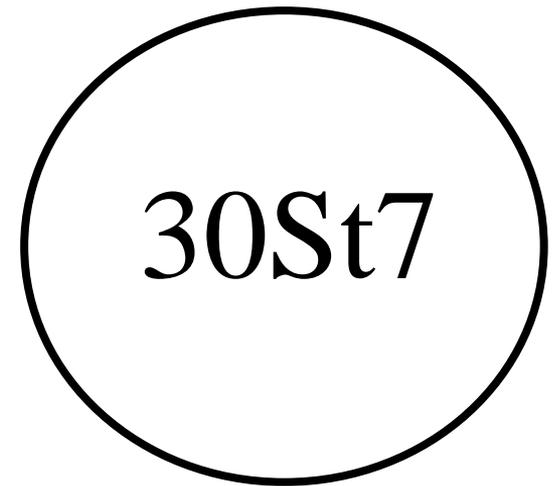
Steps to Selective Thinning

- Make an orchard map

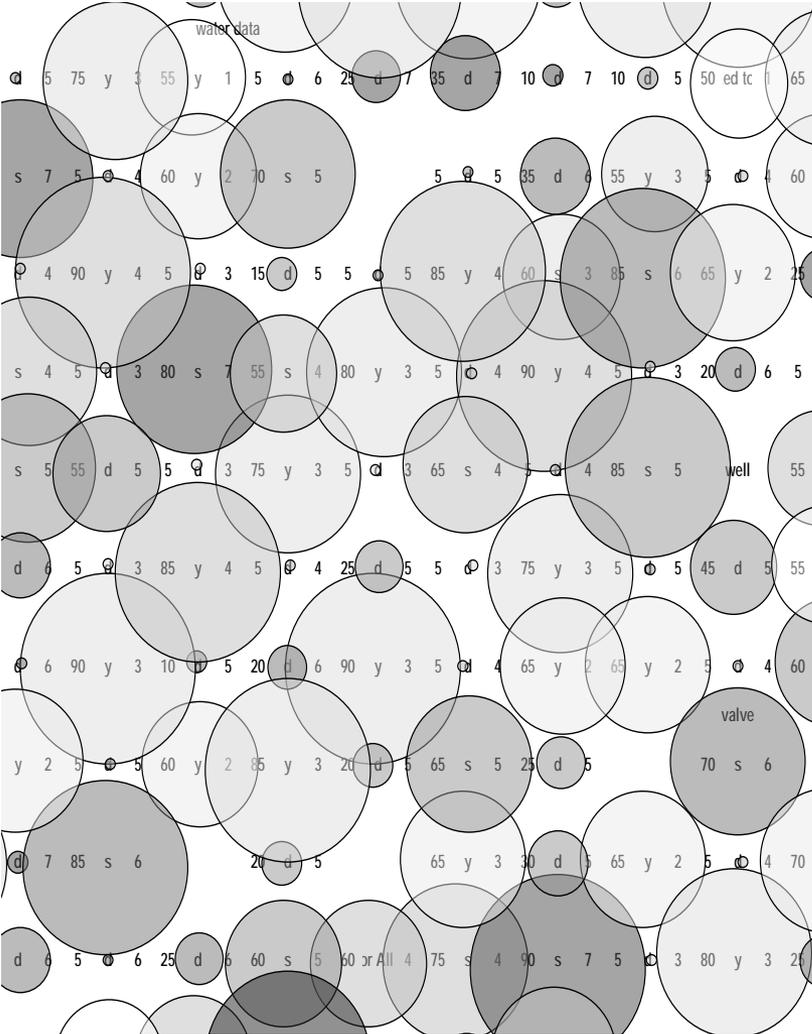
Should indicate cultivar and size of trees

- **Score each individual tree.**

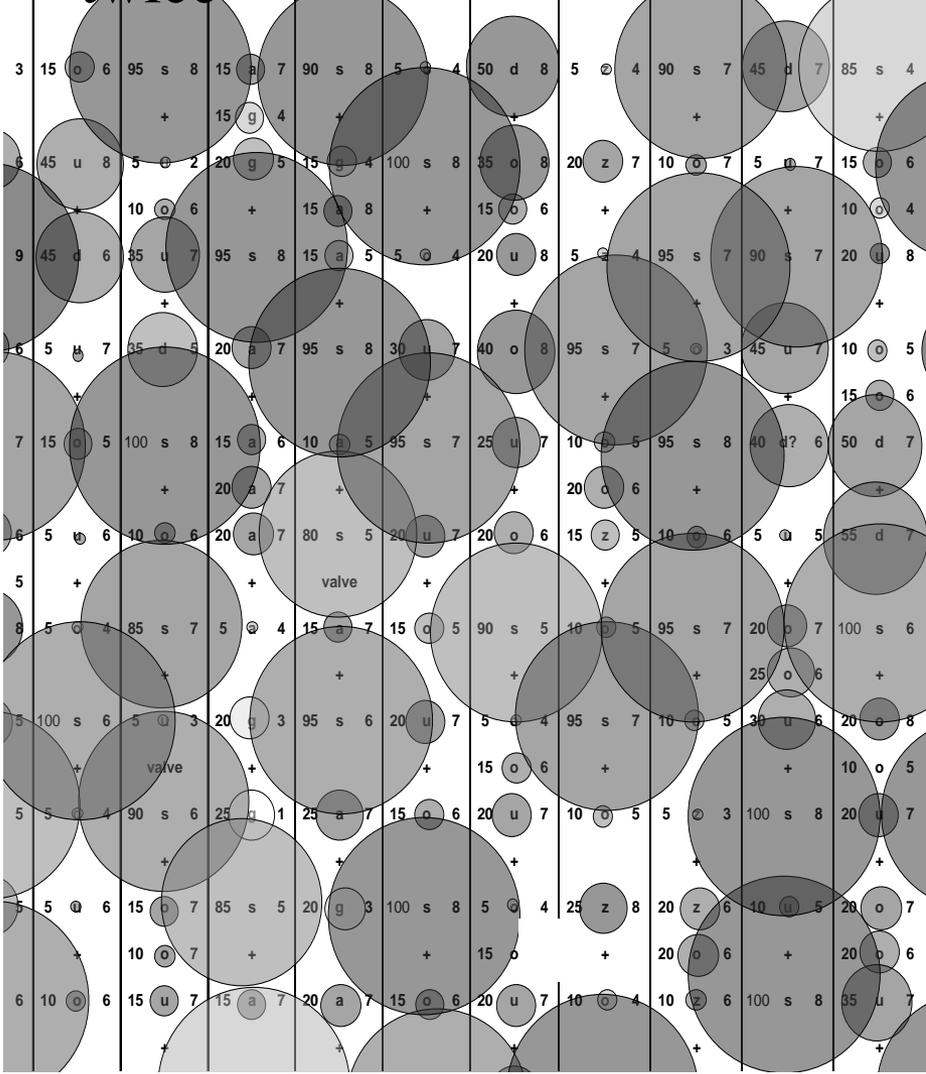
Score reflects tree condition, yield, and cultivar preference. We use 1-10 scale



Not selectively thinned

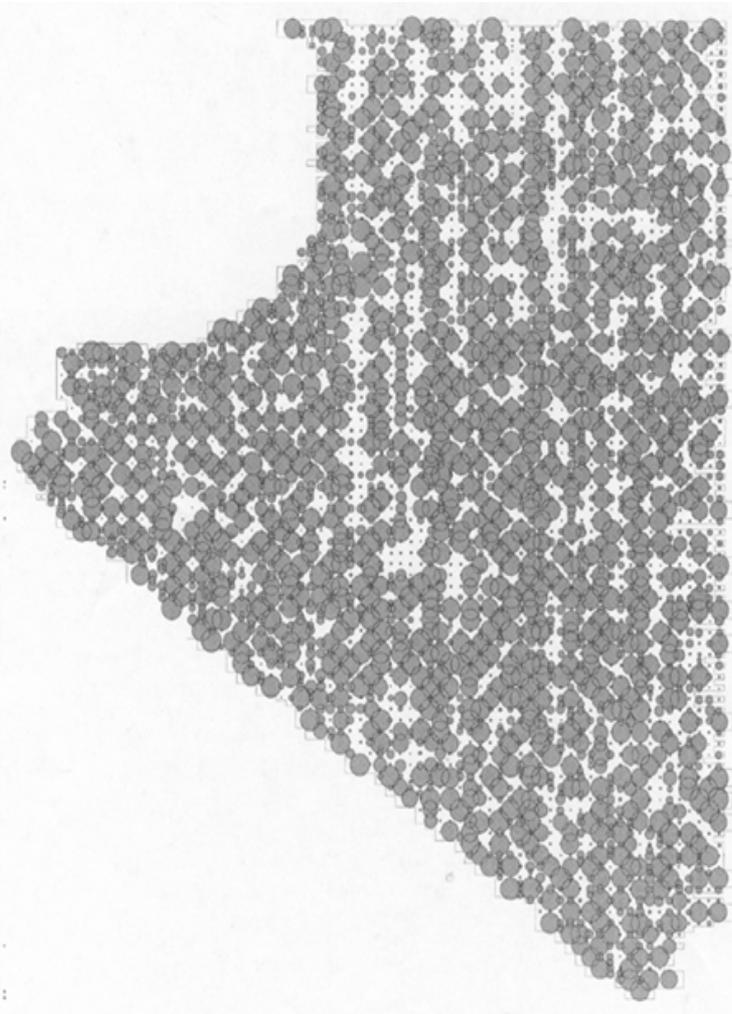


Selectively thinned twice



Before Thinning

84% of area covered
by canopies.



After Thinning

49% of area covered
by canopies.



Yields from a selectively thinned orchard.

---Bill Goff

Year	U.S. Crop	Lb./acre
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1998	Off	942
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About 50% of trees cut down this winter by selective tree removal

1999	On	1706
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2000	Off	1365
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2001	On	1571
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2002	Off	1287
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About 45% of trees cut down

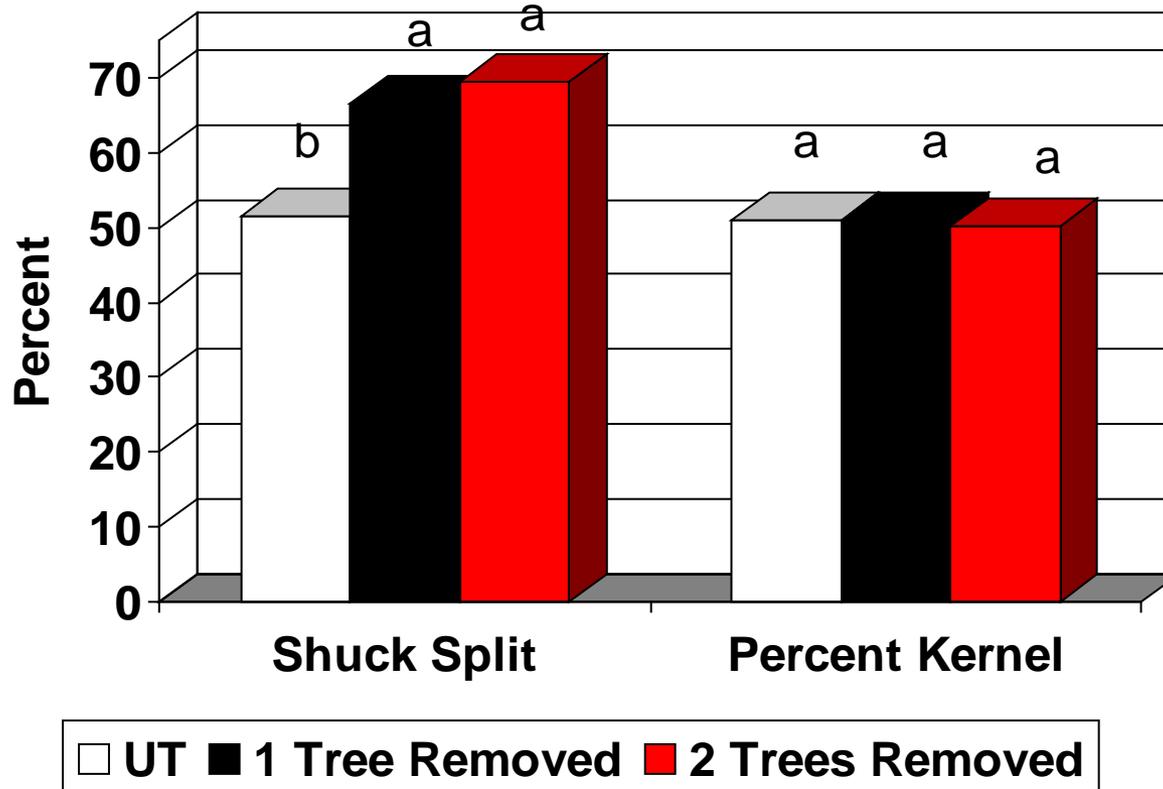
2003	On	1231
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45% increase from previous off-year
5 yr. average of 1432 through 2 thinnings, with no year less than 1200 lbs.

Alternate bearing is affected by when you thin.

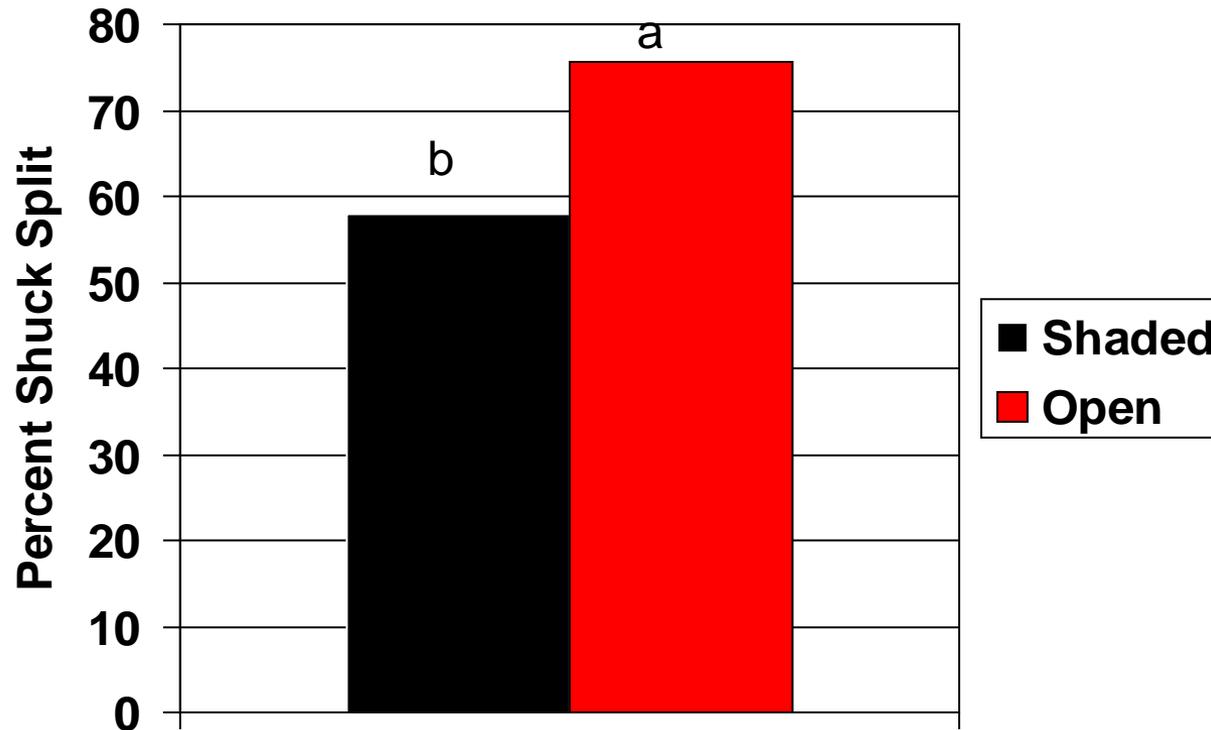
- If you thin before an 'on' year, alternate bearing is reduced
- If you thin before an 'off' year, alternate bearing is increased.

Shuck Split on October 5, 2007



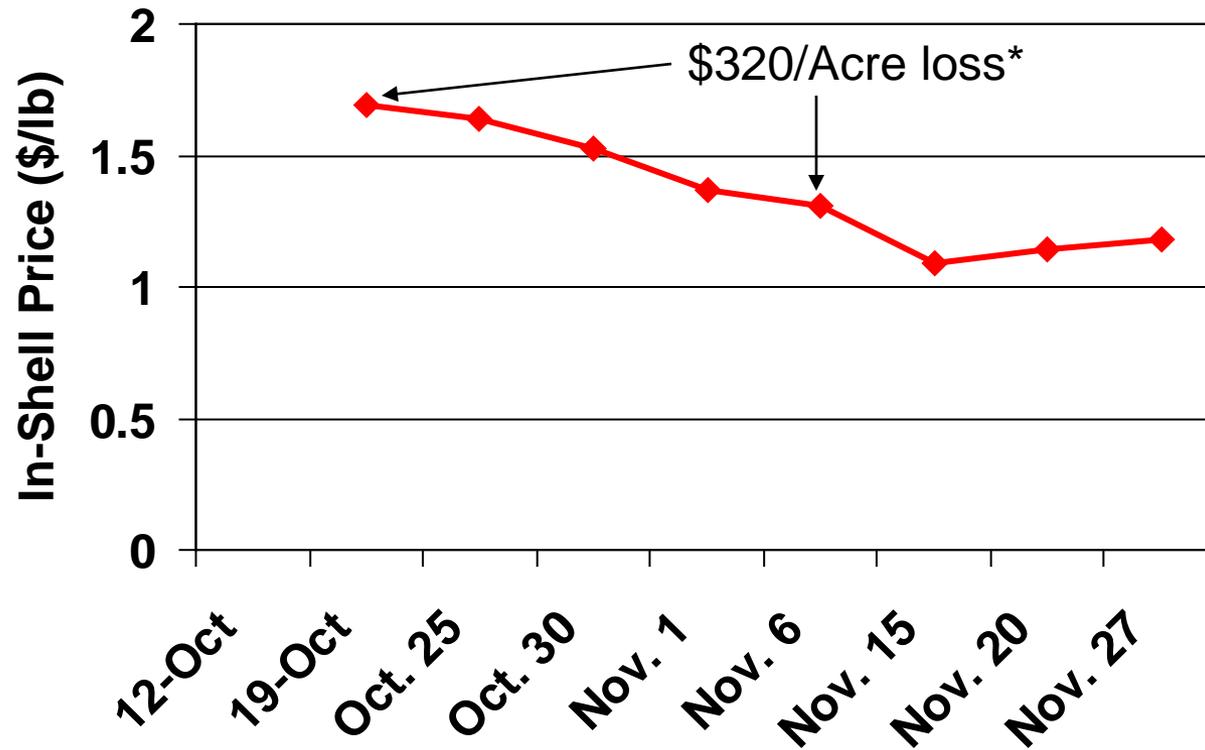
Bars with different letters indicate a significant difference at $P \leq 0.05$

Shuck Split by Tree Side



Data Taken from trees with at least 1 adjacent tree removed

2007 Pecan Prices



Price = In-Shell Price for 49-51% Desirable (USDA)

*Based on 1000 lbs/A



Can be done for approximately \$13/acre











Keys to Spading Pecan Trees

- Prune back according to tree size
 - 4-5” diameter: very little pruning required
 - 15” diameter: top at 16’, leave 3 limbs cut back to 4’
- Water, Water, Water

Fruit Thinning

- Removing fruit from the tree prior to floral induction (mid July-early August)
- Improves return crop
- Increases current season quality
- Some cultivars respond better than others



Fruit Thinning of Pecan

- Evaluate crop load around July 4
- Toward mid-late July begin cutting nuts
- When ovule development is $\frac{1}{2}$ way, it is time to thin



Fruit Thinning of Pecan

- Lubricate pads with silicon gel
- Grab tree/limb at center of pad
- Shake for 3 seconds and check



When and How Much to Thin?

Nut Size		Example		Optimum Crop Load
>70/lb		Elliott		60-70%
50-70/lb		Cape Fear, Stuart		50-60%
<50/lb		Oconee		45-50%

Characteristics of Pecan

- Cross pollinated crop
- Similar to people
 - Takes two to make a seed
 - Seedlings are different from the parent and each other

Seedling Vs. Cultivar

- Pecans may be either grafted cultivars or seedlings.
- Cultivar = Variety



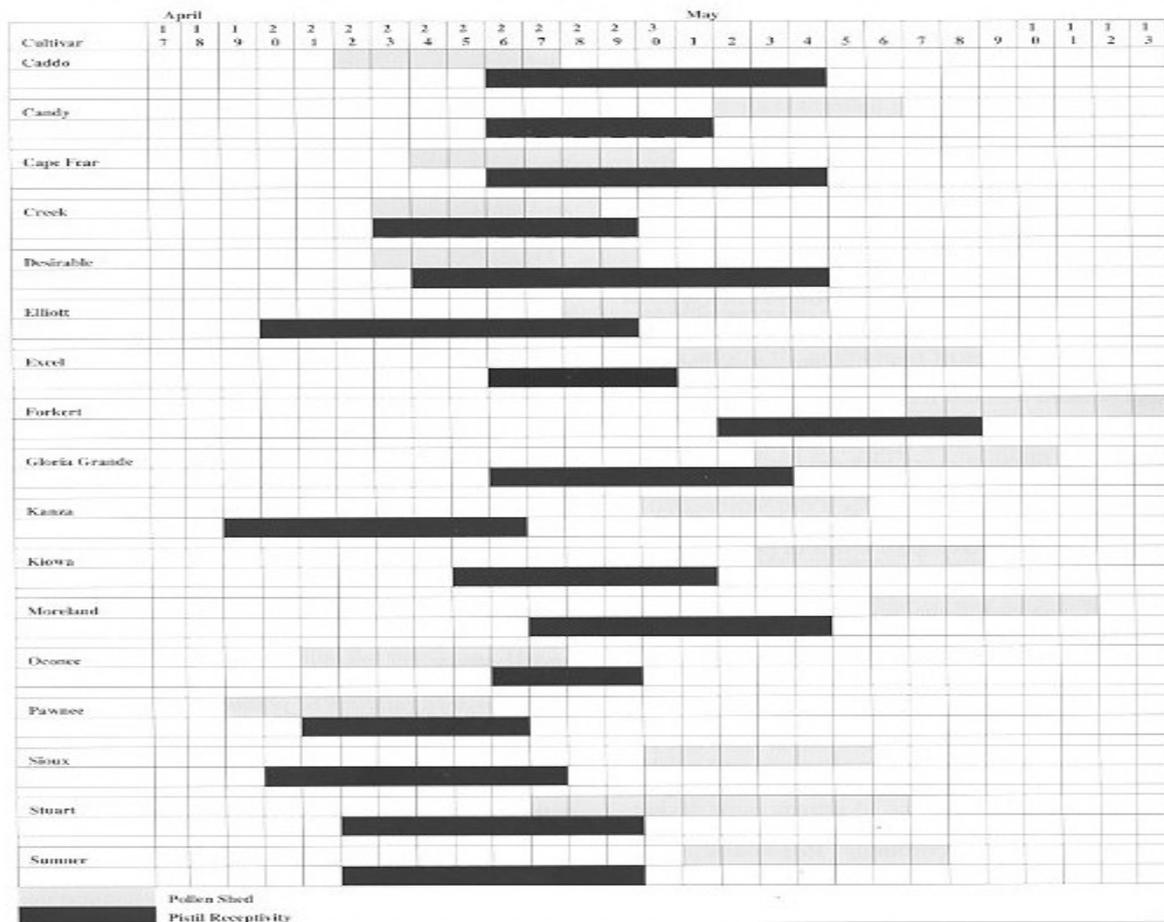
Seedling trees have diverse nut size, nut shape, and kernel quality.

Type I and Type II Pecans

- Type I (protandrous)-pollen matures before pistil is receptive
 - (Desirable, Oconee, Cape Fear)
- Type II (protogynous)-pistil matures before pollen
 - (Stuart, Sumner, Elliott)
- Timing of flower maturity may change with time for a particular variety
- Flower maturity occurs earlier and for shorter durations in older trees

Southeastern Pecan Growers Handbook

Table 1. Pollination chart for pecan varieties recommended for use in commercial pecan orchards in Georgia.



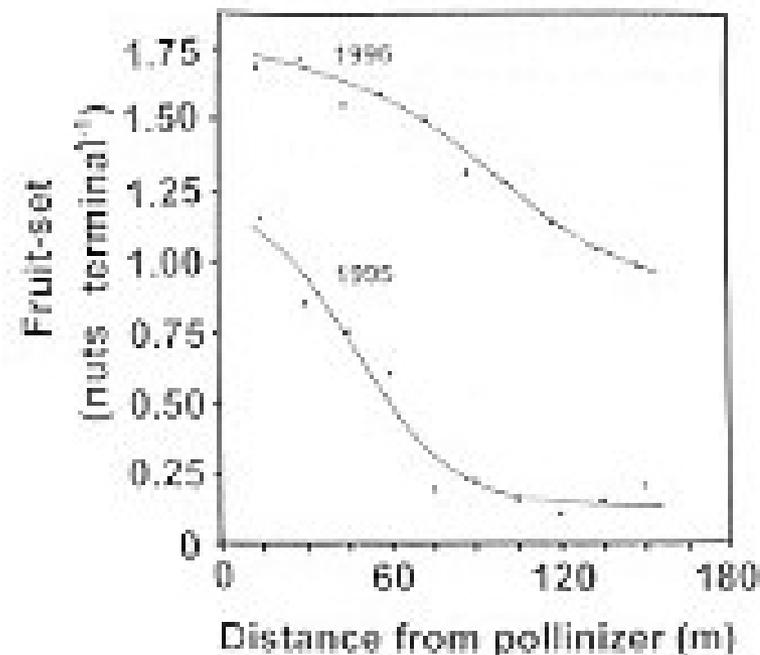


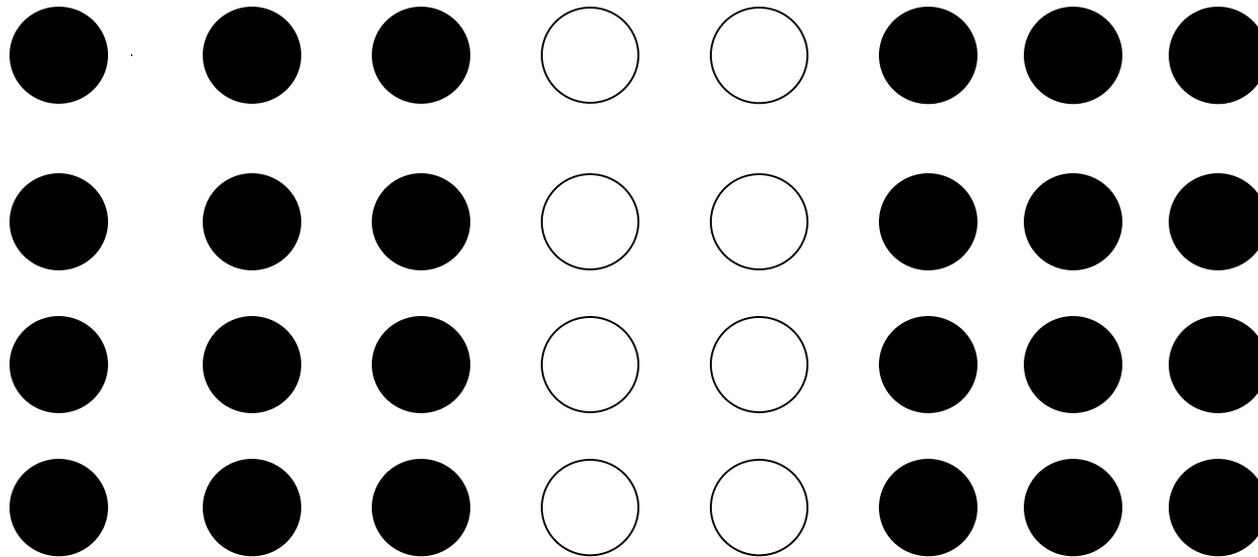
Fig. 3. Fruit-set in a large block-type orchard in 1995 and 1996 of 'Desirable' as a function of distance from the pollinizer ('Stuart'). Orchard configuration was repeating blocks of 19 rows of 'Desirable' and four rows of 'Stuart'. There was a decline in fruit-set (y) in 1995 [$y = a + bx + cx^2$ ($a = 1.50$; $b = -0.002$; $c = -9.35 \cdot 10^{-5}$; $r^2 = 0.96$, $\alpha \leq 0.001$)] and an eastward increase in set in 1996 [$y = a + bx + cx^2$ ($a = 1.80$; $b = -0.003$; $c = -1.18 \cdot 10^{-5}$; $r^2 = 0.95$, $\alpha \leq 0.001$)].

Providing Sufficient Pollination

- Fruit set declines with distance from pollinator
- In off year, yield may be as much as 30% less on trees more than 2 rows (80') from pollinator
- Pollinator should be placed no more than 150' from main variety

Pollination & Planting Design

- Block Planting



Every 5th Tree on Every 5th Row

