

Pecan Orchard Design and Establishment

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UGA Horticulture

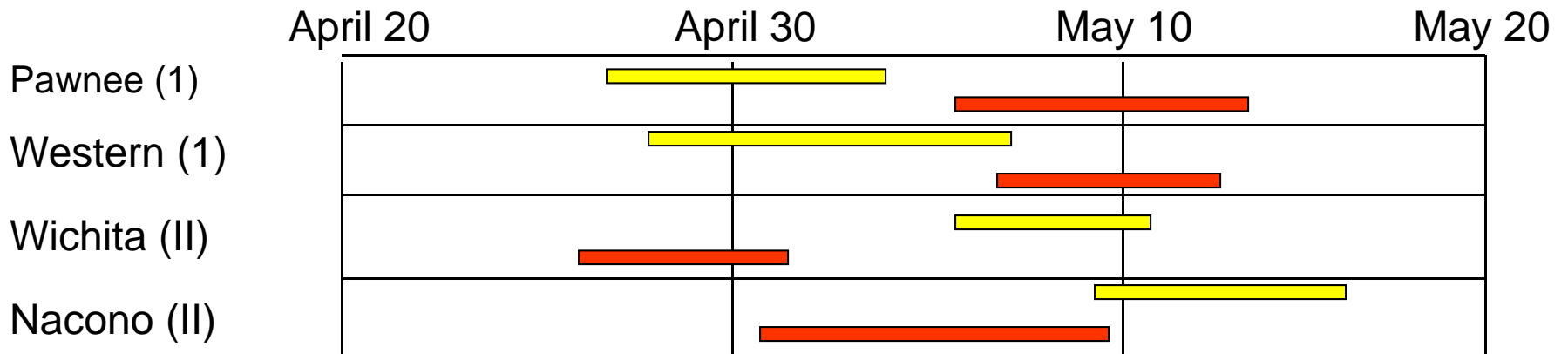


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Pecan Pollination



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

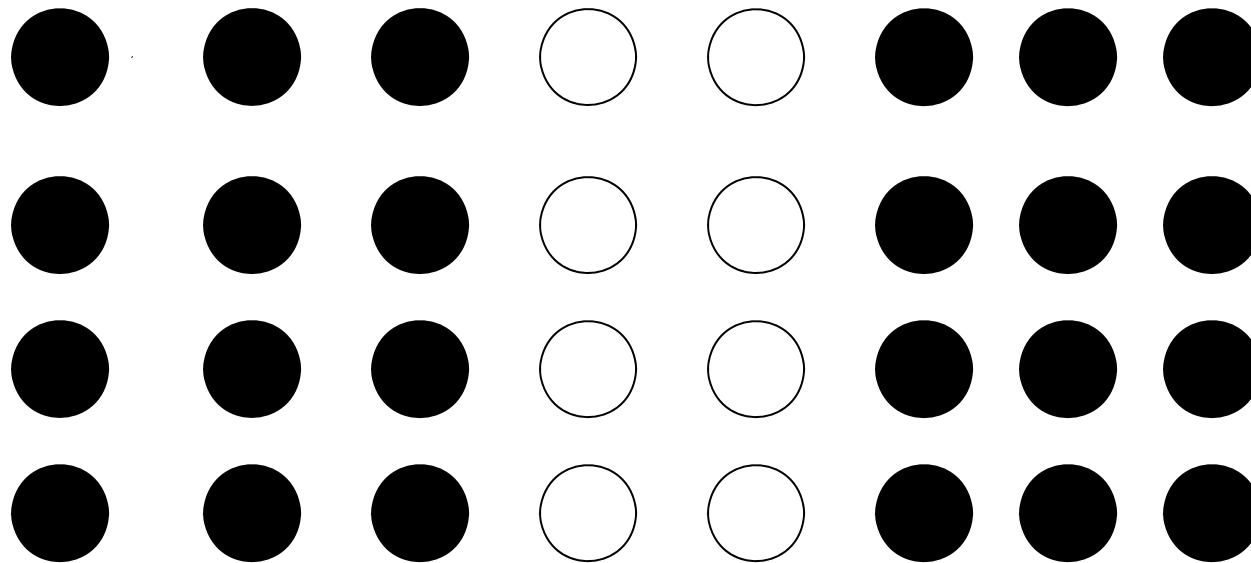
Pollinizer Guidelines

- Plant both Type 1 and Type 2 cultivars in any planting.
- Recommendations vary
 - 5th Tree on every 5th Row
 - 15% pollinators
 - 150 ft minimum distance
 - Alternate 4 rows: 2 rows
- Weather and differential crop stresses can affect bloom patterns in some years.
 - Diversity is Key:
 - 3 varieties better than 2; and 4 varieties better than 3, etc.

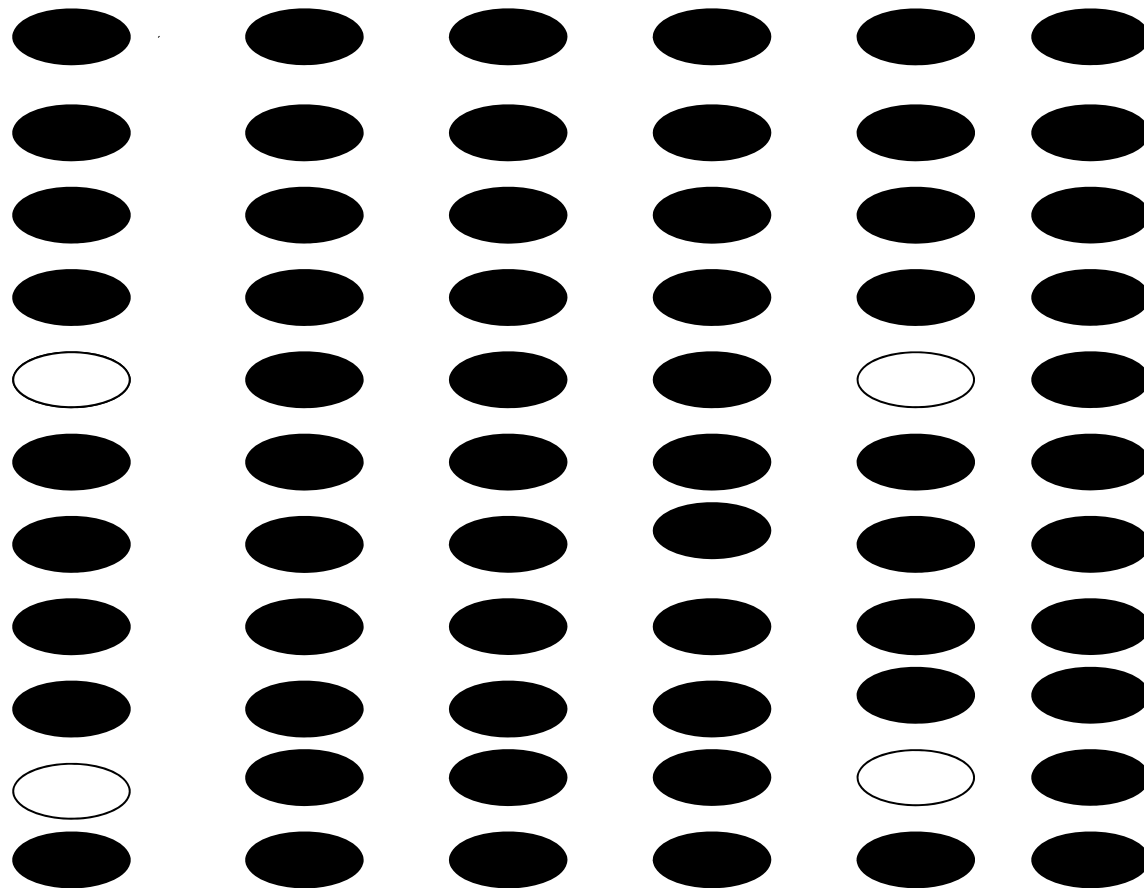


Pollination & Planting Design

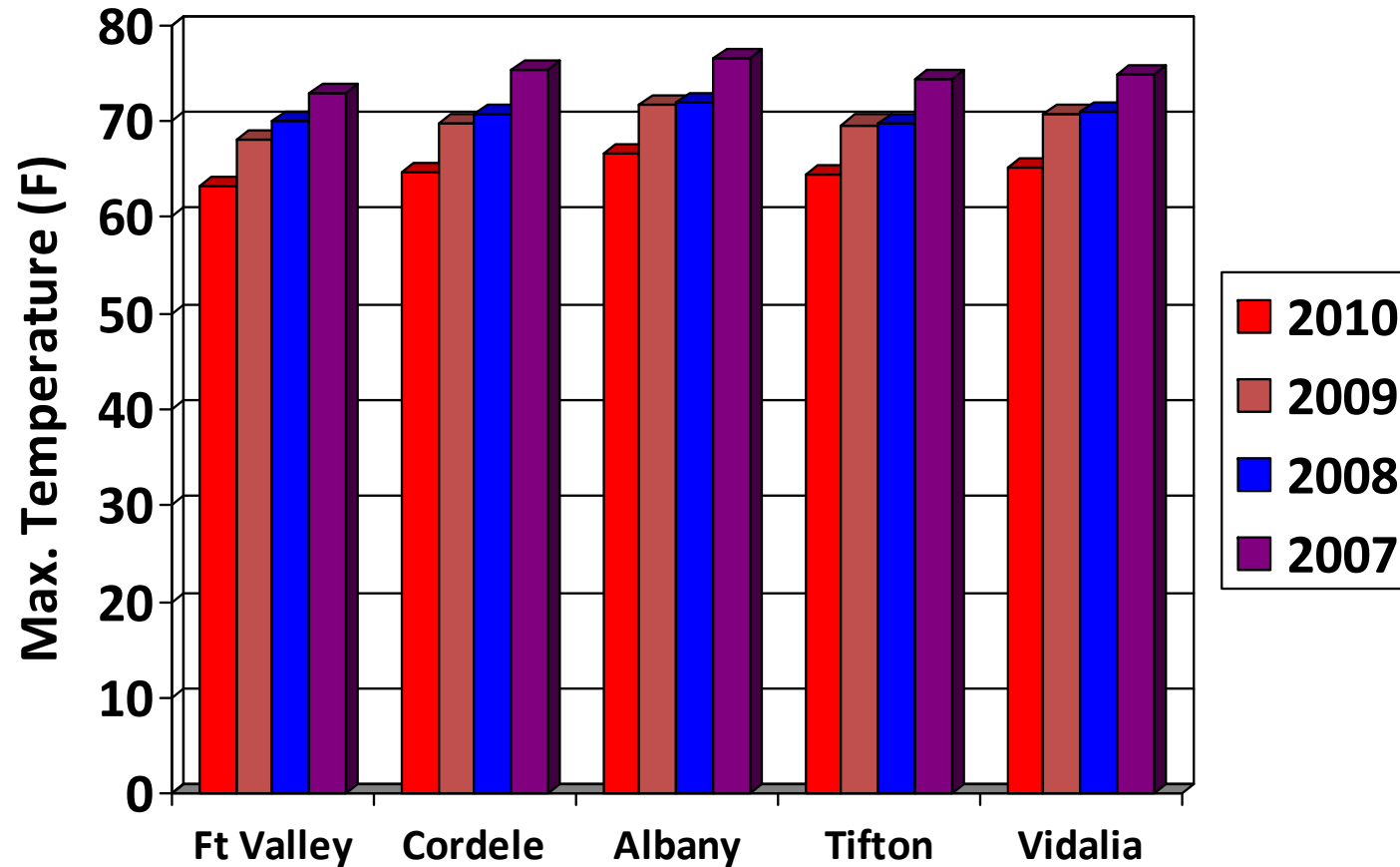
- Block Planting



Every 5th Tree on Every 5th Row



Average Maximum Temperature March





Green immature catkins with no evidence of anther dehiscence suggest that Stuart is a few days from pollen shed.

•Because many female flowers on adjacent Desirable trees are already receptive, they cannot be pollinated by Stuart, because they will no longer be receptive when Stuart pollen is shed.

Rough, glistening fully developed stigma indicating receptivity of 'Desirable' flower is near peak.



Pollination

No Pollination

Self-Pollination

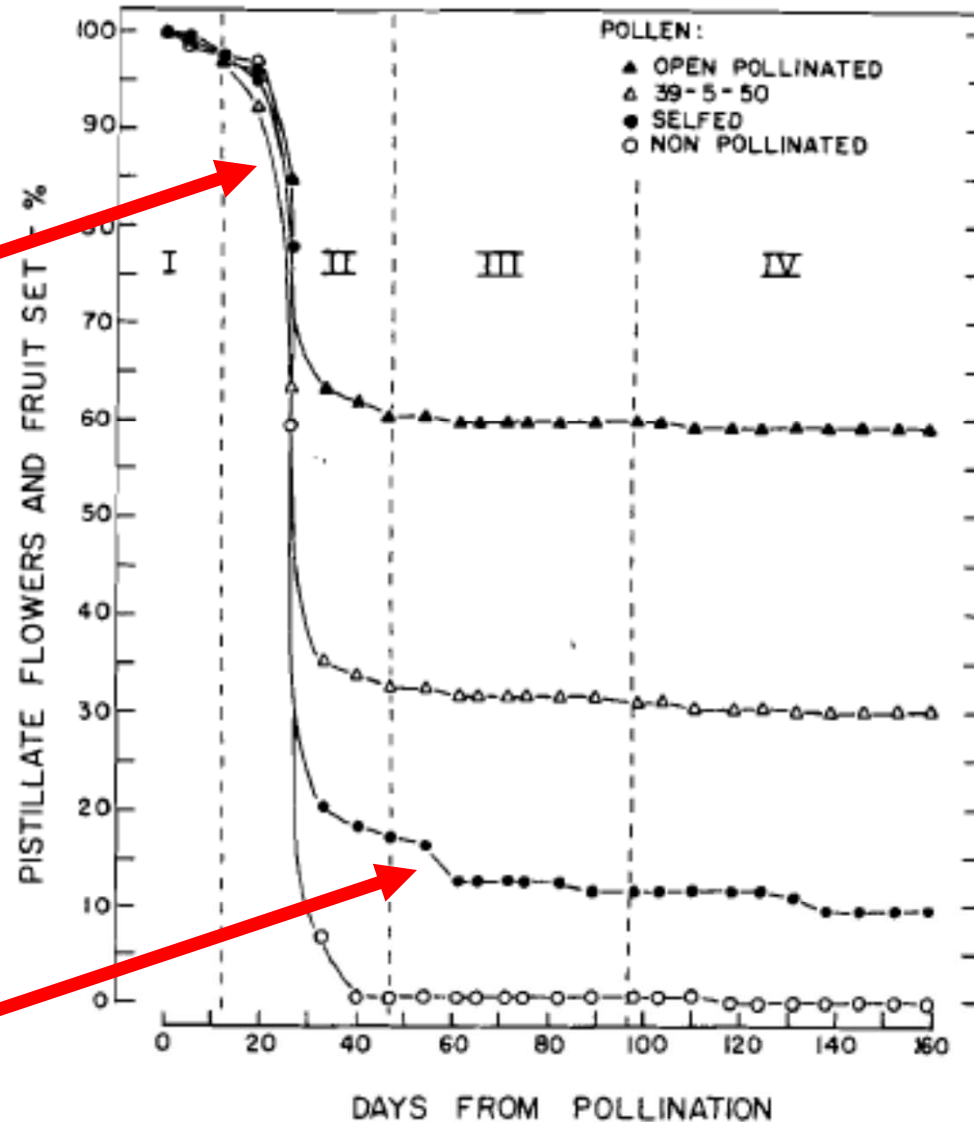


Fig. 2. Effect of self-, cross-, open-, and no pollination on pistillate flower and fruit abortion of 'Desirable' pecan. The numbers I, II, III, and IV designate the 1st, 2nd, 3rd, and 4th drops, respectively.

Effect of Self-Pollination

---Marquard, 1988

	Self Pollination	Cross Pollination
Weight	5.4g	6.5g**
Volume	7.4 ml	8.3ml**
% Pops	11.7%	3.6% ^{NS}

Self Pollination results in:
17% less nut wt
11% smaller volume

Tree Types

- Container grown
 - Plant while dormant works well
 - Spring planting less successful
- Bareroot
 - Plant while dormant: January - March



#1 (Pre-Plant) Rule for Planting Pecan Trees:

- ***DO NOT PLANT PECANS IN POORLY DRAINED SOIL***



Planting Too Deep

- Most common cause of problems with young pecan trees
 - Trees unable to develop adequate brace roots

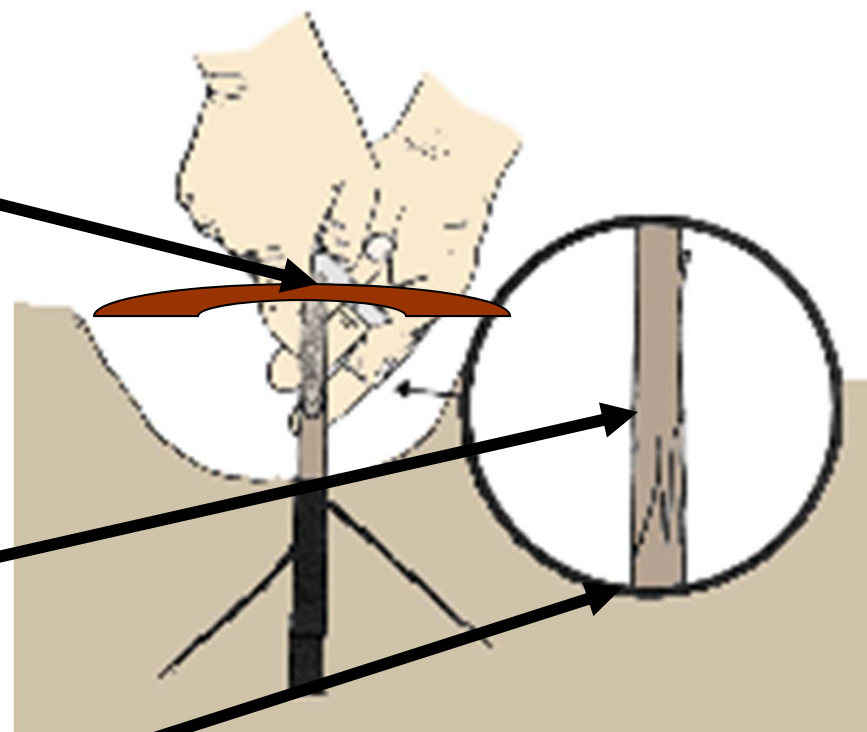


Why are trees commonly planted too deep?

When a tree is grafted below soil line, an artificial planting depth discoloration is created when soil is mounded back, and trees are replanted to this depth “the depth they grew in the nursery”. They often then sink further as soil settles.

Pecan, roots won't readily develop from the mature-wood grafted top.

So major roots needed for anchorage cannot develop except underground several inches, where their effectiveness is greatly diminished.





- Planting Depth
 - Better to plant too shallow than too deep
 - Highest lateral root even with or just under soil line



Planting

- Bareroot: prune root to 18 inches, remove lateral roots; prune top by 1/3-1/4.
- Container: prune any wrapped roots at container bottom



30"

20"

10"

Root length at planting

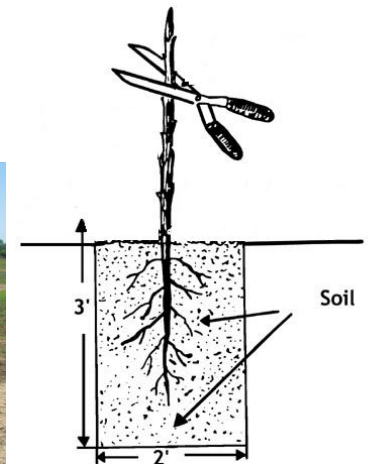
Tree survival & growth depends on new root development, not the existing root system. New roots develop from the cut surface. More important in tighter soils.

Root Pruning

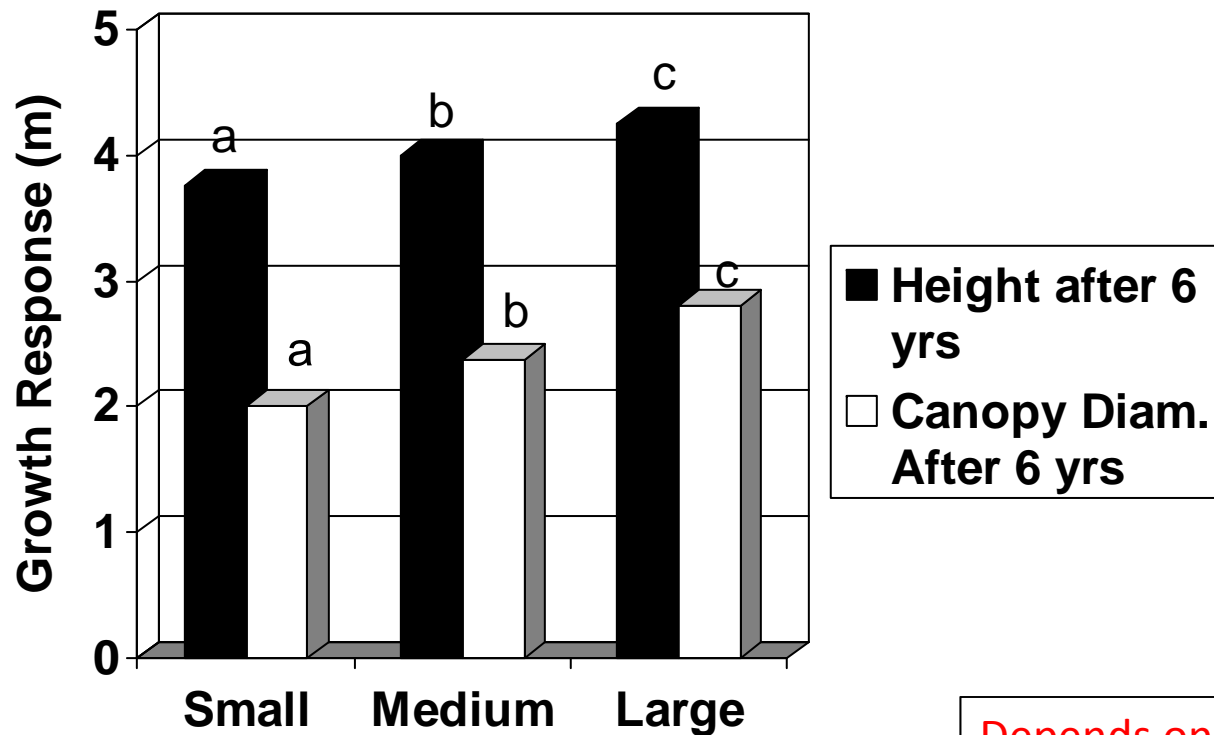


Planting

- Do not allow tree roots to dry out
- Heal-in for long term
 - Keep roots moist and covered in field
- Dig with 18" auger, deep enough to hold root system
- Fill hole with same soil
- Fill hole ¼ full of water, add dirt into the hole
- Pack soil, but do not compact
- Protect trunks from sunscald & herbicide
 - Trunk wraps/guards
- Prune top back by 1/3 to ¼
 - Faster rate of growth & more vigorous
 - Leave 2 buds



What size tree should I plant?



Depends on Age of Tree

Small=3'-6'
Medium=6'-7'
Large=7'-9'

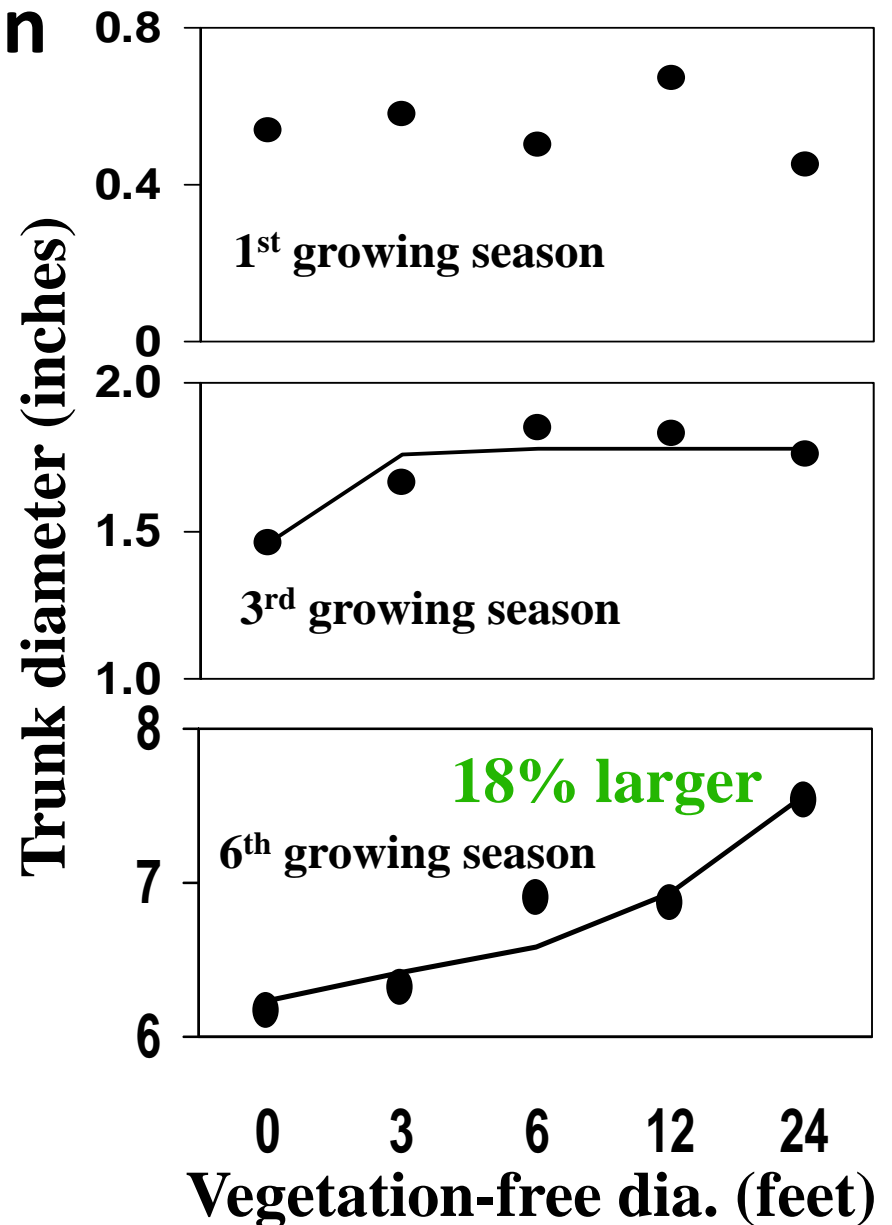
THE TWO MOST IMPORTANT FACTORS IN YOUNG TREE SURVIVAL & GROWTH

- Eliminate Weed Competition
- Adequate irrigation



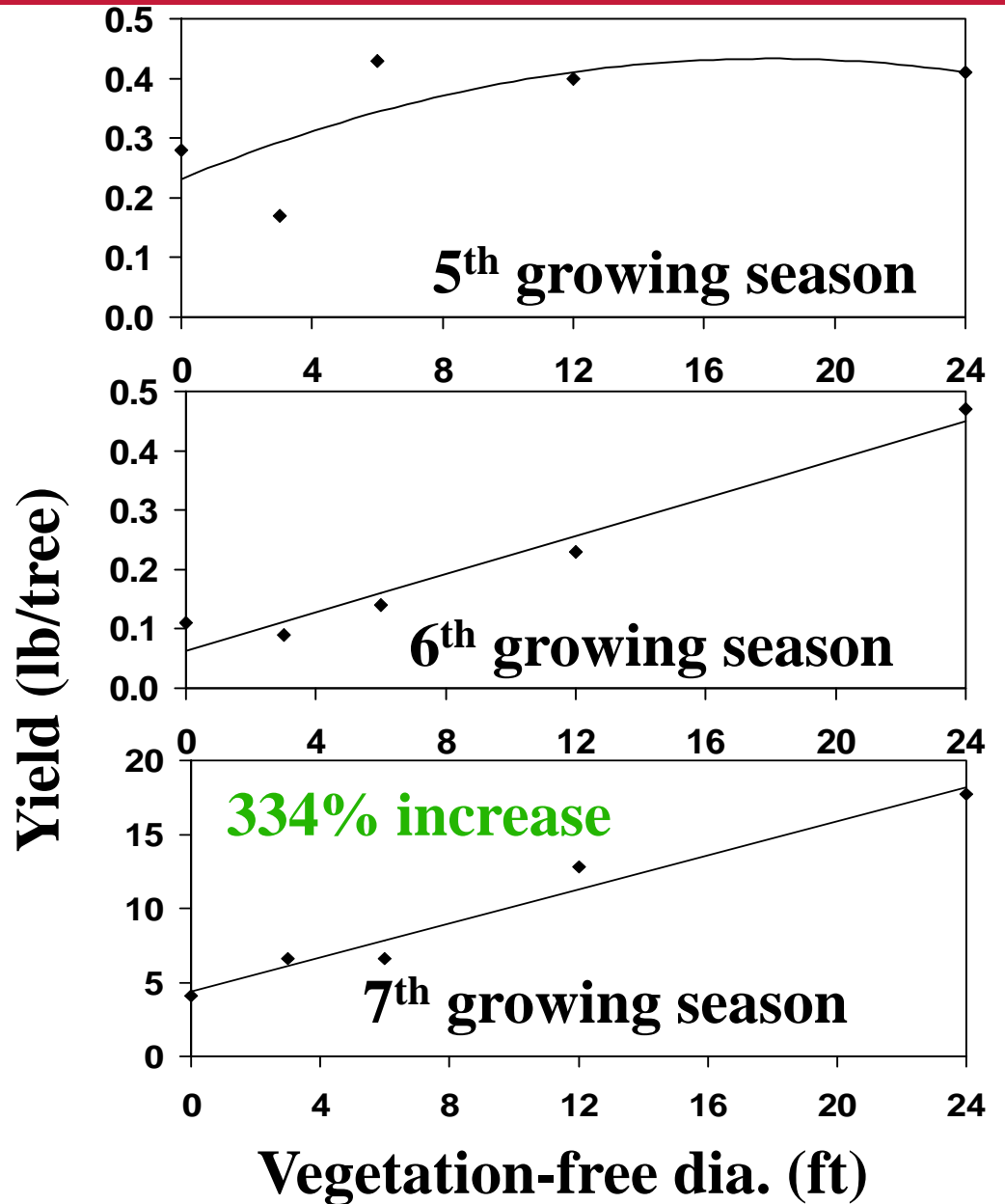
Vegetation-free Distance in Bermudagrass Sod

- ‘Results
 - No effect 1st & 2nd year
 - 3rd year largest tree in 3 – 24 ft vegetation-free circle
 - 4th year largest tree in 6 – 24 ft vegetation-free circle
 - 5th & 6th largest in 24 ft vegetation-free circle



YIELD

- Token yield in the 5th & 6th growing seasons.
 - 5th year 6 ft or greater produced most yield
 - 6th year 24 ft dia most yield
- 7th growing season 18 lbs/tree (1089 lb/a; 20'x35' spacing) with 24 ft dia.



Fertilization Recommendations for Young Trees

- Focus on P,K, Zn---not N!

Rate of 10-10-10/per tree

Year	April	June
1	0	0.5-1 lb
2	1-2 lbs	1-2 lbs
3	2-3 lbs	2-3 lbs
4	3-4 lbs	3-4 lbs

- Apply Zinc Sulfate at 1-3lb per tree for the 1st 3-4 yrs
- 2-3 sprays foliar Zn if deficiency symptoms show
- Mouse Ear Trees:
 - Apply Ni at rate of 1.5 qts/100 gallons



Is There An Advantage To Fertigation?



If You Fertigate

Amount of N/acre

Year	April	May	June
1	0	0	5 lbs N
2-4	5 lbs	5 lbs	5 lbs

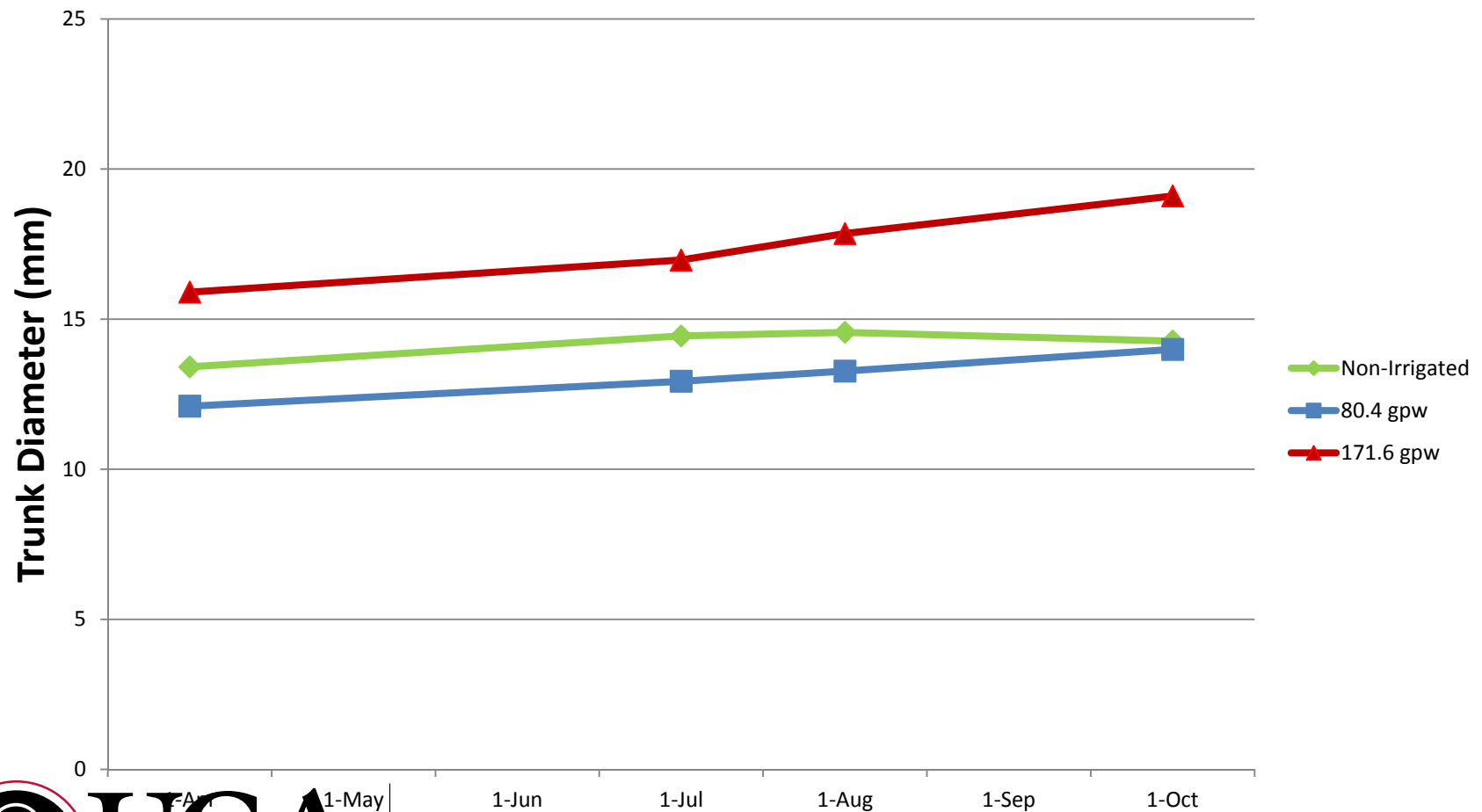
- Apply granular P,K, Zn over the tree row in March or April of years 1 and 2
 - 40 lbs P
 - 40 lbs K
 - 25 lbs Zn Sulfate



How Much Water Do Young Trees Need?



Young Tree Irrigation---Year 1

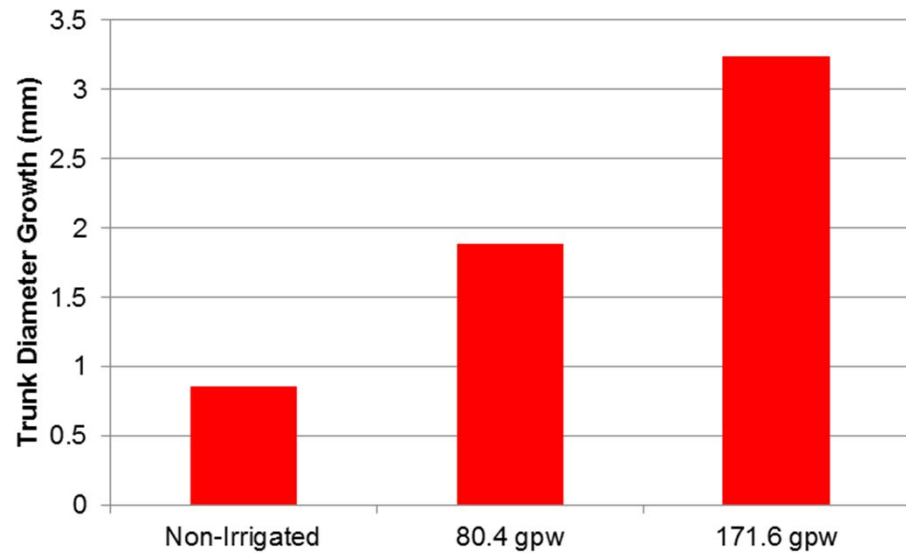


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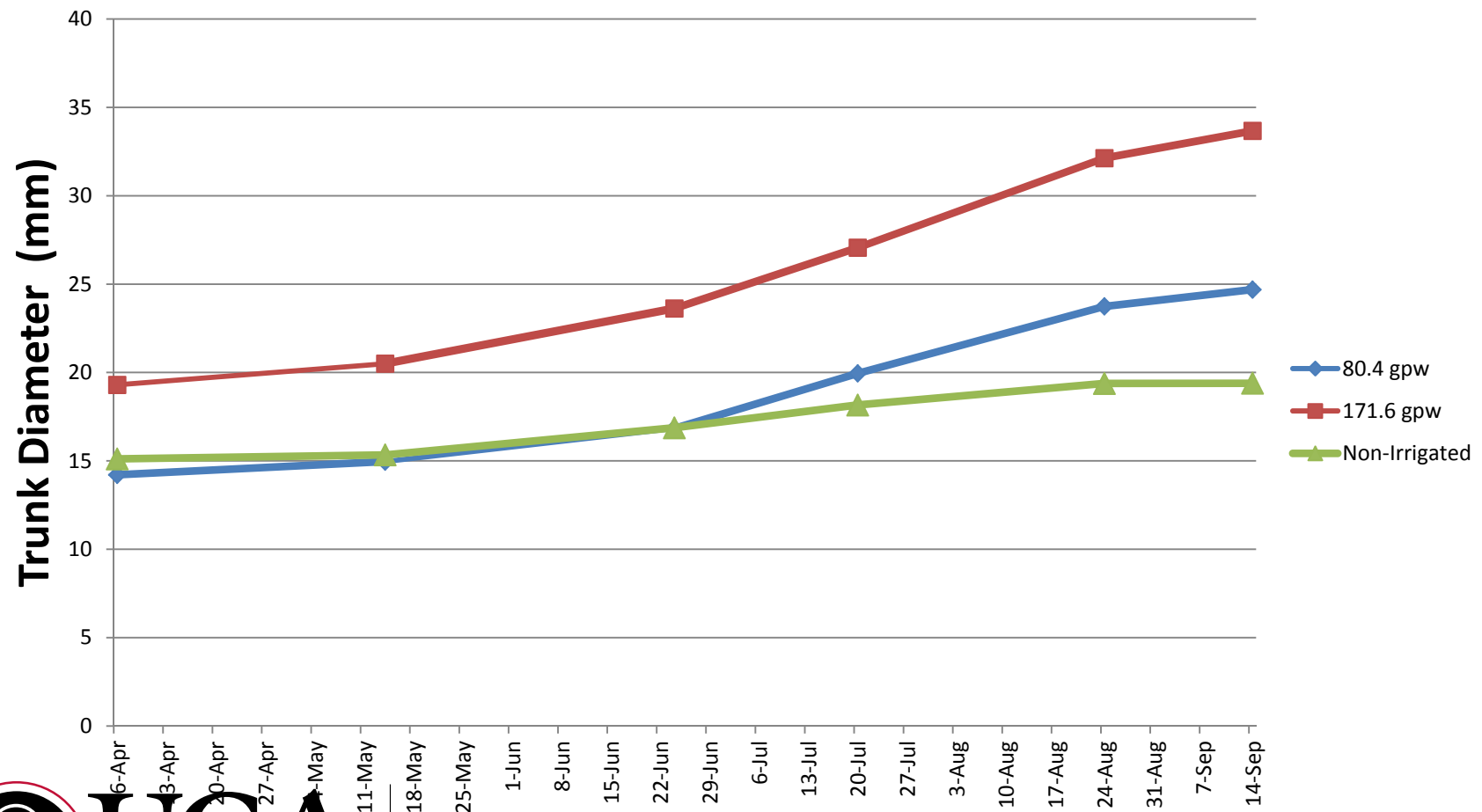
Young Tree Irrigation

- Treatments:
 - 6.7 gph X 4 hrs X 3 days/week=80.4 gpw
 - 14.3gph X 4 hrs X 3 days/week=171.6 gpw
 - Non-Irrigated



	Indiv. Leaf Area	Leaf Length	Mean Leaf Width	Max Leaf Width	Chlorophyll Index
Non-Irrigated	11.9a	6.3a	1.8a	2.8a	11.4a
80.4 gpw	26.8b	10.3b	2.5b	4.1b	21b
171.6 gpw	21.2b	8.6ab	2.4b	3.8b	24.7b

Young Tree Irrigation---Year 2

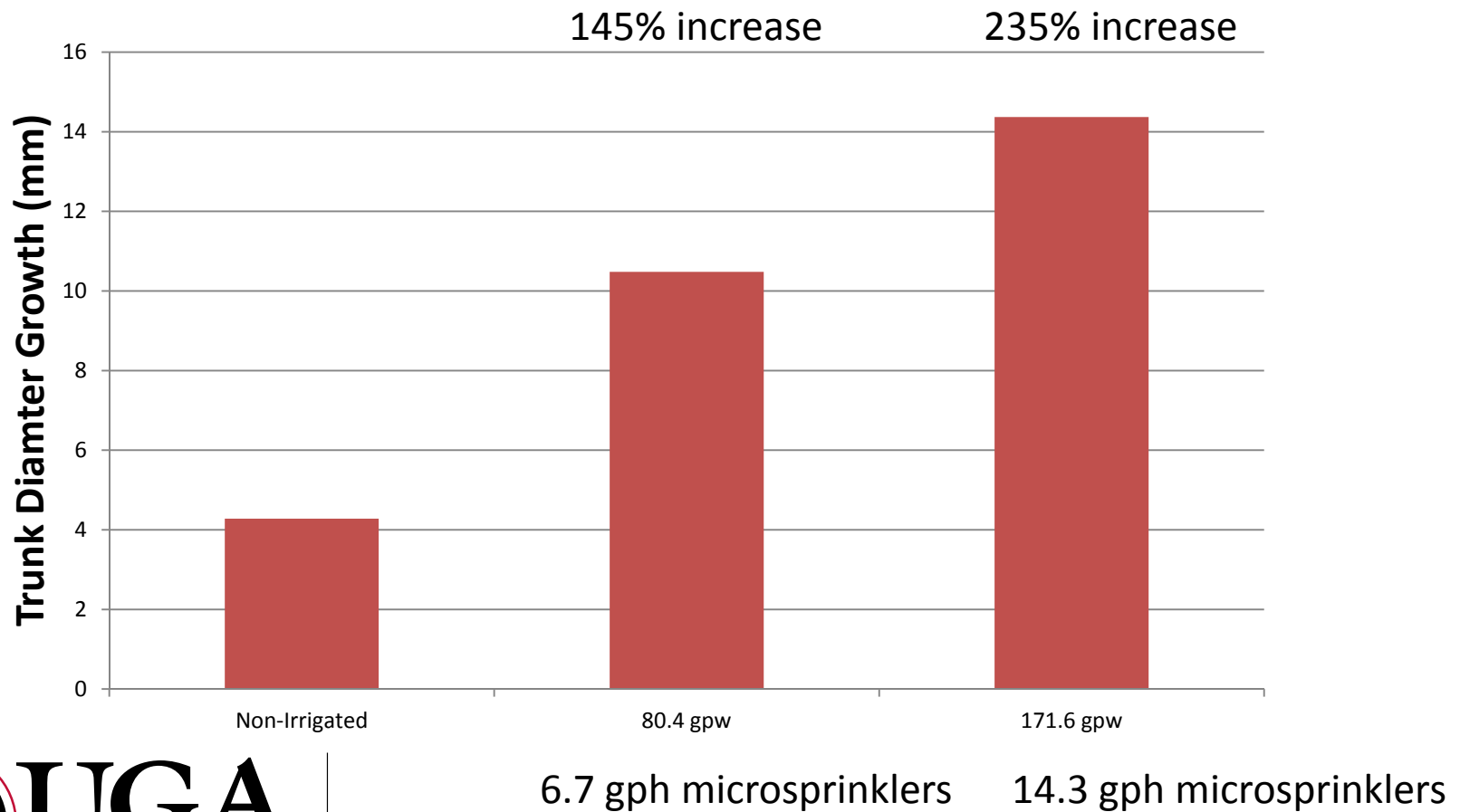


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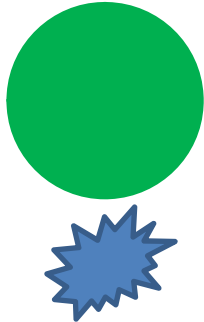
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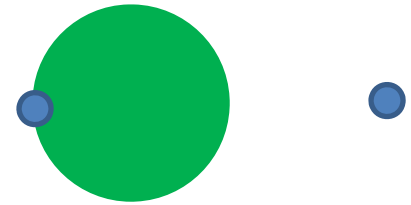
Young Tree Irrigation---Year 2



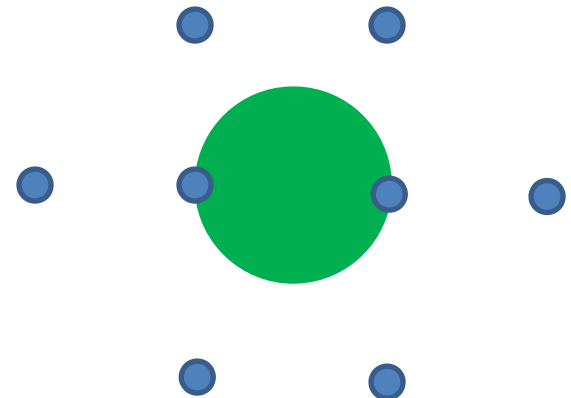
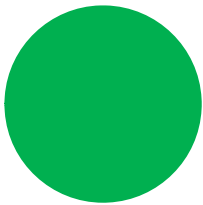
Drip vs Microsprinkler



14.3 gph microsprinkler
172 gpw

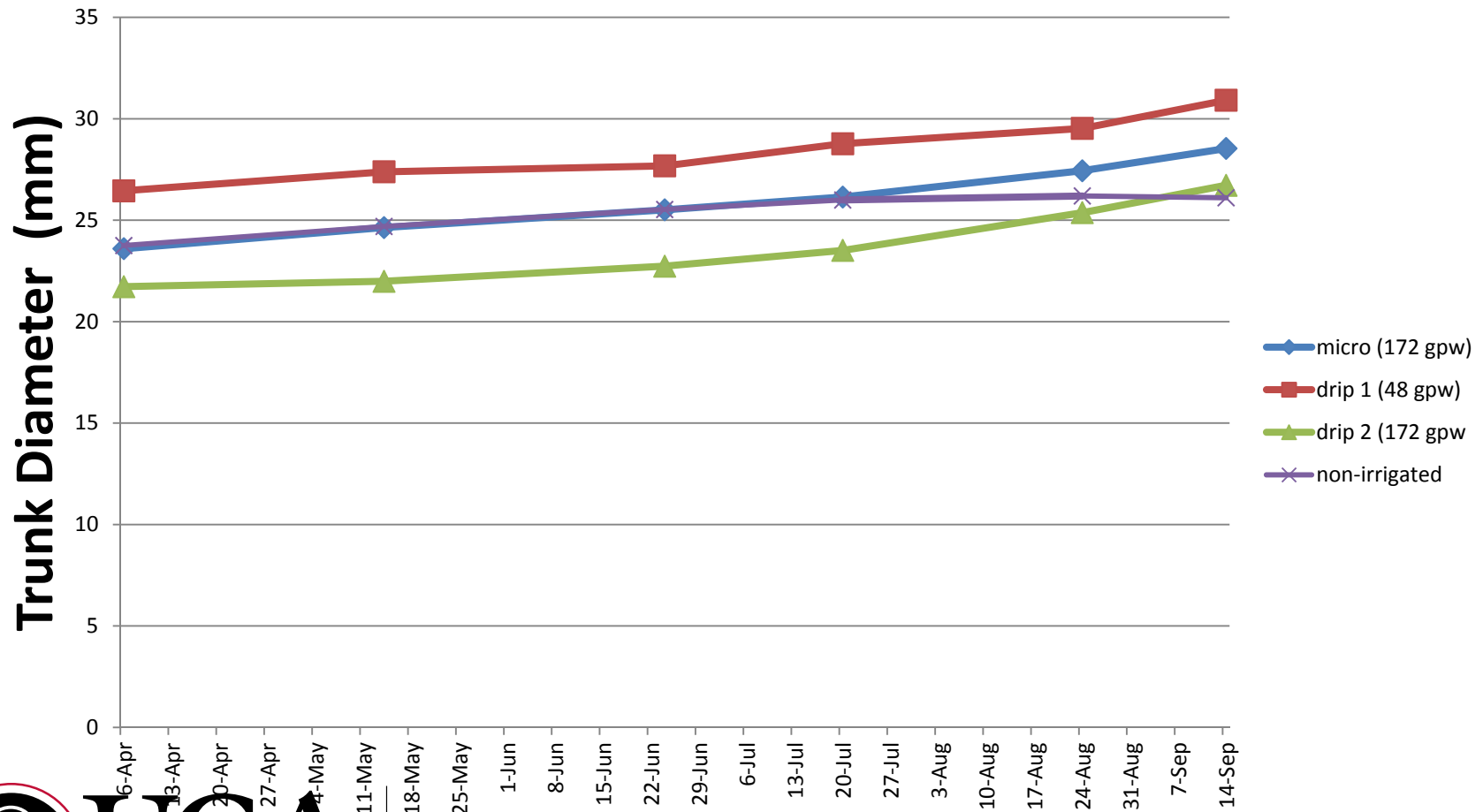


Two 2 gph drip emitters
48 gpw



Eight 2 gallon per hour drip emitters
~172 gpw

Drip vs Microsprinkler Year 1---Seasonal Growth

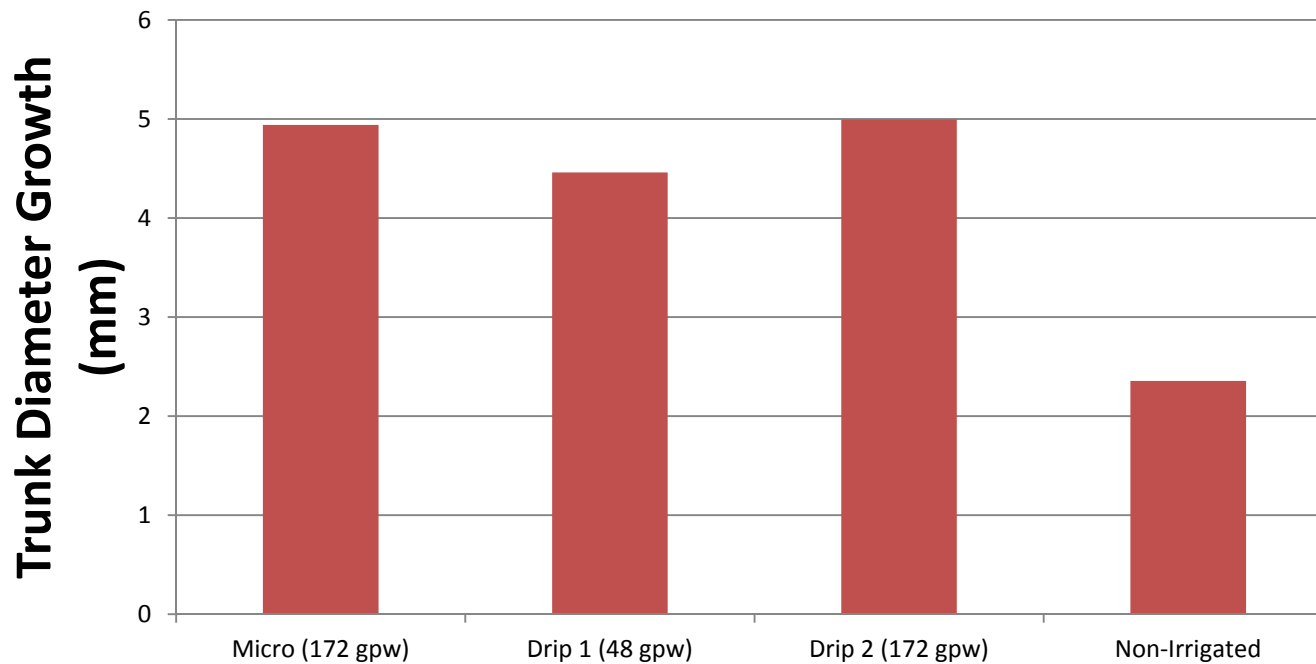


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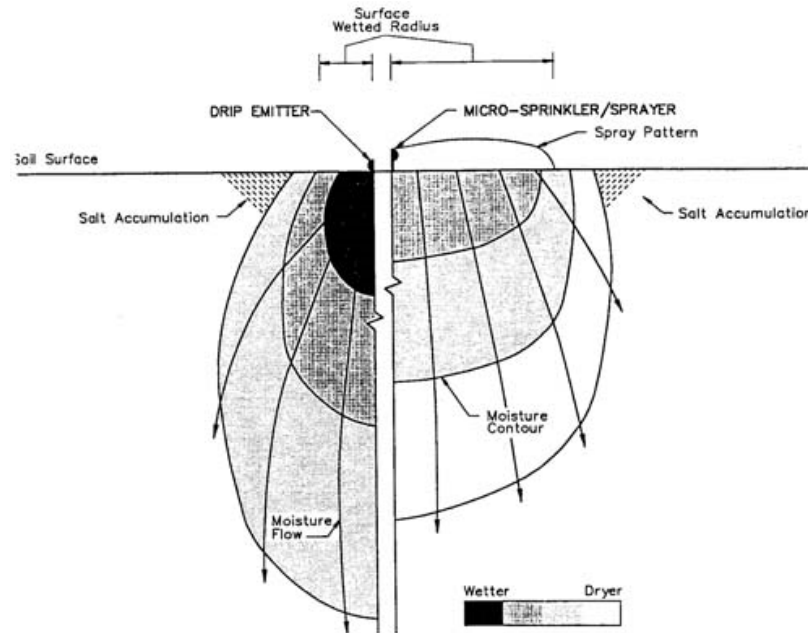
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Drip Vs Microsprinkler

Desirable---1st year trunk diameter growth



Pattern of Moisture Spread For Drip vs Microsprinkler



Spreading water over larger soil surface areas is particularly advantageous on coarse, sandy soils (where water from a drip emitter moves very little laterally) and on fine-textured clay soils (where water from a drip emitter may puddle on the surface).

What Herbicides are Safe to Use Around Young Trees?

- Postmergence:
 - Glyphosate, Paraquat, or Glufosinate ---burndown
 - Sandea---nutsedge, pigweed, wild radish
 - Aim---pigweed/morning glory
 - Venue---wild radish, pigweed, morning glory
 - Basagran—some broadleafs and yellow nutsedge
 - Poast---annual and perennial grasses
 - Select---annual/perennial grasses
 - Fusilade---annual/perennial grasses
- Pre-emergence:
 - Surflan
 - Prowl
 - Chateau
 - Alion can be used after year 3.
 - Simazine can be used after year 2
 - Diuron can be used after year 3 (avoid on sandy soils)



Leaf Scorch of Young Pecan Trees

- Primarily a problem of poor root establishment
- Limitations to root growth
 - Wet spring
 - Wet/Dry extremes
 - Poor soil
 - Water-logged
 - Planting immed. behind pine trees
 - Hard Pan/High water table
- Fertilization

