

**Budding, Planting, and  
Young Tree Training**

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EMERITUS

**9<sup>th</sup> Advances in  
PISTACHIO PRODUCTION**  
November 2, 2020

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**Successful Farmers  
Know:**

- 1. What to do.**
- 2. How to do it.**
- 3. When to do it.**
- 4. And then ... they do it !**

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**A REMINDER FOR US ALL:  
WE DON'T KNOW WHAT WE  
DON'T KNOW!  
SO.....  
IF YOU THINK YOU DON'T  
KNOW.....  
  
ASK!**

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# From a Roll of Dough...

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1. EVALUATE YOUR SITE WITH BACKHOE PITS
2. ASSESS WATER QUALITY, QUANTITY
3. DESIGN YOUR IRRIGATION SYSTEM AND HAVE IT IN PLACE AND TESTED BEFORE PLANTING
4. CONFIGURE YOUR PLANTING TO MINIMIZE OBSTACLES, SUCH AS POLES, PUMPS, BUILDINGS



PLANNING PAYS!



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LEAVE 6" SLACK IN DRIP LINE BETWEEN TREES AND SECURE ITS LOCATION. MAKE SURE THE EMITTER IS AT THE BASE OF THE TREE!



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# TIMING

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## EXECUTION



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### PLANTING STOCK: AVAILABLE IN THREE STYLES

1. STANDARD, UNBUDDED ROOTSTOCK IN A SIX MIL PLASTIC SLEEVE. ALTHOUGH IT CAN BE CLONALLY PROPAGATED, IT IS TYPICALLY PRODUCED FROM SEED OF KNOWN PARENTAGE.

2. CLONAL ROOTSTOCK, ALMOST EXCLUSIVELY OF UCB1 PARENTAGE (A SELECTION OF ONE UCB1 OR PGII SEEDLING). IT COMES IN VARIOUS SIZE, FROM THREE TO 48 INCHES TALL.

3. PRE-BUDDED ROOTSTOCK WITH WHATEVER SCION/STOCK COMBINATION THE GROWER DESIRES.

PLANTS COME IN ALL KINDS OF POT DESIGNS AND SIZES, WHICH ARE OFTEN PROPRIETARY TO THE NURSERY. THERE HAS BEEN NO UC RESEARCH TO ASSESS THE ESTABLISHMENT SUPERIORITY BETWEEN POT DESIGNS.

NOTE: MENTION OF SPECIFIC NURSERIES DOES NOT CONSTITUTE AN ENDORSEMENT

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CLONAL UCB1 AFTER THE MIST CHAMBER

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Clonal Pots: Typically ~ 4" x 4" x 7-9.5"

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CLONAL PISTACHIO  
ROOTSTOCK, UCB1  
PARENTAGE

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The Ellepot : Sierra Gold Nursery's  
DIRECT PLANT SYSTEM



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CLONAL UNSTAKED 36" TALL



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UNHEADED PLANTS: CUT TO  
24"....???



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**WHEN SHOULD I PLANT?**

1. LATE WINTER TO EARLY SPRING THE BEST TIME, IN MY OPINION. I PREFER EARLY FEBRUARY TO LATE MARCH FOR ROOTSTOCKS ONLY. PLANT BUDED TREES ONCE THE THREAT OF FROST IS PAST (APRIL)
2. LATE SPRING TO EARLY SUMMER (MID-MAY TO MID-JUNE) IS A POOR TIME TO PLANT. YOU HAVE MISSED THE "GRAND PERIOD OF GROWTH" IN THE SPRING, THE PLANTS GO INTO IMMEDIATE STRESS, AND IT IS HIGHLY UNLIKELY THE PLANTS WILL BE LARGE ENOUGH TO GET A HIGH BUD TAKE. PLUS, YOU HAVE FAILED TO ACHIEVE THE FIRST YEAR OBJECTIVE OF SCION GROWTH TO THE TOP OF THE STAKE FOR DORMANT HEADING TO 42-44 INCHES FOR THE VASE TRAINING METHOD.
3. FALL PLANTING ONLY MAKES SENSE TO ME IF YOU PLANT BUDED TREES CLOSE TO 48" TALL NO LATER THAN SEPTEMBER 1. THIS GIVES ABOUT FIVE WEEKS TO GET THEM "HOOKED UP" INTO THE NATIVE SOIL BEFORE YOU HAVE TO CUT THE WATER OFF BY OCTOBER 7 TO HARDEN THEM OFF AND PREVENT LOSS TO FREEZING TEMPERATURES THAT TYPICALLY OCCUR BETWEEN NOVEMBER 15-25.

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Place the “dip” of the metal stake towards the tree.



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**STANDARD AND PRE-BUDDED PLANTS SHOULD NOT BE HANDLED BY THE TRUNK OF TREE. CREW SHOULD USE THE TOP OF THE SLEEVE, WITH ONE HAND UNDERNEATH TO PREVENT ROOT TEARING OR DISRUPTION OF THE BALL**



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**BALLING SHOVEL, THE WEAPON OF CHOICE FOR PISTACHIO PLANTING**



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**DO NOT GET THE TOP SOIL IN THE PLANTING HOLE IF IT HAS BEEN TREATED WITH PRE-EMERGENT HERBICIDE. TOSS TO THE SIDE**

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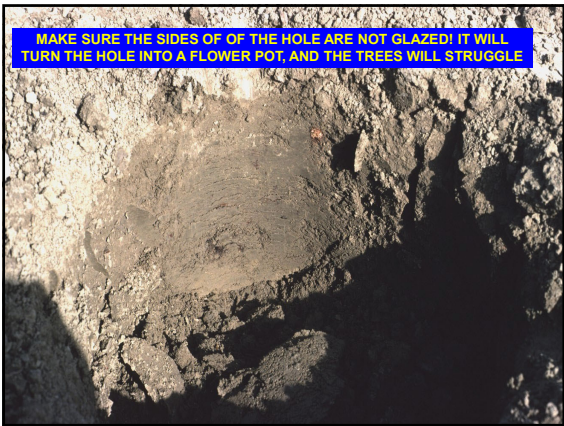
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**MAKE SURE THE SIDES OF OF THE HOLE ARE NOT GLAZED! IT WILL TURN THE HOLE INTO A FLOWER POT, AND THE TREES WILL STRUGGLE**

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Basins insure uniform irrigation, especially on berms and soils with poor infiltration. Place the pot on top of the stake for easy pick up.

Two side-by-side photographs showing a tree sapling in a field. The left photo shows the sapling in a pot, and the right photo shows the pot placed on top of a wooden stake.



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**CHECK YOUR ROOTBALL SOIL MOISTURE REGULARLY!  
BEING WET ON THE SURFACE DOES NOT NECESSARILY MEAN THE BALL IS  
ALSO, ESPECIALLY IF IT GOT TOO DRY BEFORE IRRIGATING!**



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Checking the moisture of the rootball is  
**CRITICAL** during the first eight weeks!



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Overwatering is the most common  
cause of poor baby tree growth!



Healthy



Sick from water logging

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**CORREGATED PLASTIC TUBE STAPLED TO STAKE  
AND DIRT COVERING THE BASE TO PREVENT  
DESSICATION OF TRANSPLANTREQUIRES A CLEAN FIELD!**



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**KEEP THE MAROON LEAVES COMING BEFORE BUDDING!  
GIVE THEM A GOOD IRRIGATION ABOUT A WEEK AHEAD OF BUDDING, THEN  
ABOUT FIVE DAYS AFTERWARD. AVOID A WET FIELD DURING BUDDING!**



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**TIME OF BUDDING DEPENDENT UPON STOCK VIGOR, PLANTING DATE,  
THE AVAILABILITY OF BUDWOOD, AND THE AVAILABILITY OF THE BUDDER**

1. STOCK PLANTED FROM JANUARY TO EARLY APRIL SHOULD BE 3/8" IN DIAMETER BY MID-JULY TO EARLY-AUGUST, DEPENDING UPON PLANTING DATE, ORIGINAL PLANT SIZE, AND CULTURAL PRACTICES.
2. DO NOT PUSH FOR BUDDING TOO EARLY! LARGER DIAMETER TREES TAKE A BUD BETTER, AND PUSH THE BUD HARDER THAN MARGINALLY SIZED TREES. THE BUDWOOD ALSO HAS TO BE UNIFORMLY MATURE.
3. CULTIVARS LIKE GOLDEN HILLS HAVE LARGER DIAMETER BUDWOOD, HENCE THE "SHIELD" CUT FROM THE STICK IS LARGER, AND THUS THE TREE NEEDS TO BE LARGER TO GET A GOOD BUD TAKE. COMMUNICATE WITH YOUR BUDDER TO LET HIM KNOW HOW YOU ARE DOING! I REPEAT....COMMUNICATE!!
4. BE CAREFUL ABOUT PUSHING THE BUD WHEN BUDDING AFTER THE FIRST WEEK IN SEPTEMBER. EARLY FROST IN NOVEMBER CAN KILL THE SHOOT, AND YOU HAVE LOST A LOT FOR LITTLE GAIN!
5. PISTACHIOS CAN BE BUDDING DURING SEPTEMBER, BUT DO NOT FORCE THE BUD. ALLOW IT TO REMAIN DORMANT, THEN CUT BACK THE STOCK IN JANUARY AND TRAIN THE BUD UP THE STAKE IN THE SPRING.

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Bud highly vigorous rootstocks as soon as it is big enough.  
Consider the use of dormant buds if your trees are ready  
before the in-season budwood is mature

A collage of three images. The left image shows a man in a green shirt and blue jeans standing next to a young tree in a field. The middle image is a close-up of a tree trunk with a ruler placed against it for scale. The right image shows a young tree in a field with other trees in the background.

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BUD AT 28-32 INCHES TO GET THE BUD UNION ABOVE THE LOCATION OF WHERE THE SHAKER HEAD ATTACHES TO THE TREE FOR HARVEST. HAVING THE UNION IN THE CLAMPING ZONE GREATLY INCREASES THE RISK OF TEARING THE BARK ON THE TRUNK.

PISTACHIOS, ALTHOUGH NOT SUSCEPTIBLE TO TRUNK WOUND CANKER DISEASES LIKE ALMOND, HEAL VERY SLOWLY. EXCESSIVE DAMAGE WEAKENS THE TREE AND MAKES IT POTENTIALLY LESS PRODUCTIVE.

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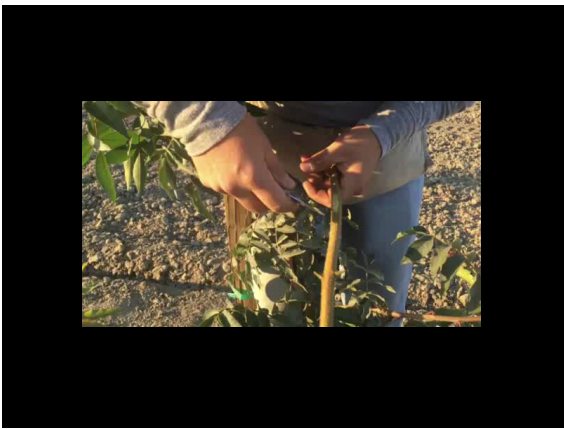
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NEWLY BUDDING TREES OFTEN "NOTCHED" ABOVE THE BUD WITH A 24 TOOTHED HACKSAW BLADE. BUD PUSHES 10-14 DAYS AFTER BUDDING

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RATHER THAN STRIPPING THE ROOTSTOCK, I STILL RECOMMEND THE STANDARD TIPPING OF ALL SHOOTS 50 PERCENT TO FORCE THE BUD. THIS IS DONE ABOUT FIVE DAYS AFTER BUDDING.



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First year goal: Get the rootstock planted and growing uniformly in time to bud by mid-July to August 1. Train the scion up above the stake. Shut the water off in time to harden off the tender shoot to prevent freeze injury in November.



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## WHY TRAIN / PRUNE PISTACHIO TREES?

- INCREASE VIGOR. RATE OF GROWTH, NOT TOTAL GROWTH!
- CREATE STRONG FRAMEWORK FOR LARGE CROP LOADS
- ESTABLISH AN EFFICIENT "LIGHT INTERCEPTOR" FOR THE ALLOTTED AREA
- INDUCE DESIRED BRANCHING WELL DISTRIBUTED WITHIN THE CANOPY
- STIMULATE NEW FRUIT WOOD
- MITIGATE ALTERNATE BEARING
- FACILITATE HARVEST AND CULTURAL OPERATIONS

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VIDEO OF PISTACHIO SHAKING  
SHOWS THE NEED FOR ADEQUATE TRUNK HEIGHT  
NOTE THE LOCATION OF THE SHAKER APRON  
JUST BELOW THE HEAD OF THE TREE



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## PISTACHIO GROWTH CHARACTERISTICS

- MODERATELY VIGOROUS
- TWO MAIN FLUSHES OF GROWTH
  1. SPRING
  2. SUMMER
- GROWTH LARGELY FROM TERMINAL BUDS. SPURS (NEOFORMED GROWTH 7-9 NODES) OCCURS LATERALLY ON ONE-YEAR OLD WOOD.
- GROWTH IN DIAMETER (GIRTH) SLOW, CREATING THE POTENTIAL FOR FLAT STRUCTURAL LIMBS, AND EXCESSIVELY OPEN TREE CENTER.
- FRUIT BORN CLOSE TO THE BRANCH TERMINAL INCREASES THE LIKELIHOOD OF GREATER LIMB ANGLE OVER TIME.
- IMPORTANT TO CREATE "COMPRESSED" STRUCTURAL BRANCHES DURING THE TRAINING YEARS.

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Young pistachios are "overpruned" during the training years due to slow girth development and strong apical dominance, which limits branching from the growth tip.



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Central Leader Tree: Trunk dormant headed at ~60°; minimal in-season pruning.



Central leader after year 2



Trunk headed at ~60° after first season of scion growth

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Central Leader Trees: 3 and 4 years old.



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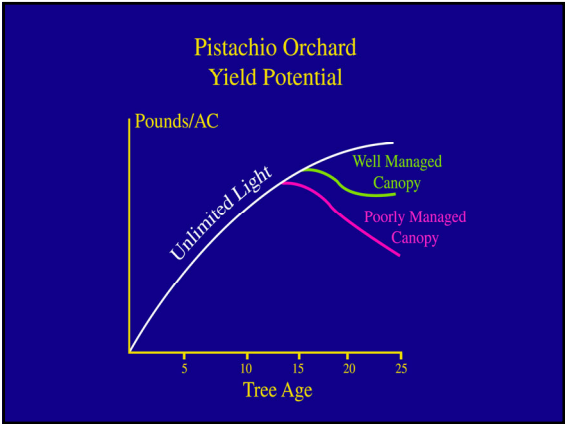
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- PISTACHIO DEVELOPMENT GOALS FOR THE FIRST SEASON**
1. DEVELOP A VIGOROUS ROOTSTOCK FOR BUDDING.
  2. BUD IN MID JULY TO MID AUGUST, DEPENDING ON VIGOR AND BUDWOOD AVAILABILITY.
  3. ACHIEVE 36 INCHES OR GREATER OF SCION GROWTH. WELL MANAGED TREES CAN GROW ONE INCH PER DAY. I ADVISE NOT HEADING THEM TO REDUCE TRUNK TAPER AND BUILD CARBOHYDRATES FOR THE FALL. WHAT IS THERE TO GAIN?
  4. BUD MISSED TREES IMMEDIATELY, BUT DO NOT FORCE THOSE BUDDED AFTER THE END OF AUGUST.
  5. WINTER PRUNE SCION AT 42 TO 44 INCHES PREFERABLY, BUT NO LOWER THAN 38 INCHES.

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MAKE PASSES EVERY 10-14 DAYS TO TIE SCION TO THE STAKE, SUCKER THE BASE OF THE STOCK, AND RE-TIP STOCK GROWTH 18 INCHES OFF THE GROUND

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IS HEADING THE TRUNKS OF FIRST YEAR TREES WORTH THE RISK?  
I SAY "NO"

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**PISTACHIO DEVELOPMENT GOALS FOR THE SECOND SEASON**

1. DEVELOP 2 TO 4 PRIMARY AND SECONDARY SCAFFOLDS.
2. TIP PRIMARIES AND SECONDARIES WHEN THEY REACH 12 TO 14 INCHES TO FORCE LATERAL BRANCHING.
3. THE LAST TIPPING DATE IS DEPENDENT UPON PLANT VIGOR AND GROWING LOCATION. KERN COUNTY GOES AS LATE AS MID-AUGUST, BUT THE EAST SIDE OF TULARE AND FRESNO MAY BE MID-JULY.
4. PINCH LEAF OFF PETIOLE AT SECOND AND THIRD NODE POSITION TO ENCOURAGE MORE THAN ONE LATERAL TO GROW.
5. CROSS TIE AS NEEDED OR DESIRED TO IMPROVE UPRIGHT TREE SHAPE.
5. PREVENT NUTRITIONAL DEFICIENCIES!! **THEY STOP TREE GROWTH!!**
6. WINTER PRUNE SECONDARIES 12 TO 14 INCHES, TERTIARIES AT 22 INCHES.

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**CONVERT THIS GROWTH POTENTIAL TO DEVELOPMENT OF A COMPACT, WELL BRANCHED CANOPY FOR EARLY PRODUCTION.**

**THIS REQUIRES SIX TO EIGHT PASSES DURING THE SECOND GROWING SEASON TO PERFORM TIMELY PINCHING OF THE PRIMARY AND SECONDARY BRANCHES.**

**PLAN TO SPEND \$250 PER ACRE ON TRAINING DURING THE SECOND YEAR!**

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Copper deficiency is common in young trees due to over-pruning and low root density. In season sprays for zinc, copper, and boron (if low in your soil) are advised to prevent stalled canopy development.

A photograph of a young tree with brown, dead leaves, indicating copper deficiency. The tree is in the foreground, and the background shows a clear blue sky.

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**ZINC DEFICIENCY**

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**WATCH OUT FOR FALSE CHINCH BUG! THEY KILL YOUNG PISTACHIOS WITH A TOXIN THEY EMIT DURING FEEDING. FOUND IN CERERAL GRAIN COVER CROPS, SPOTTED SPURGE, SHEPHERD'S PURSE, AND LONDON ROCKET**

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**GOPHERS KILL PISTACHIOS!  
TAKE CARE OF THEM IMMEDIATELY!**

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Tying young pistachios can turn poorly shaped trees from mutts to kennel club champions. The challenge is keeping the pruners from getting too creative. A couple ties to pull the canopy together, or a single spreader should suffice.



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**DO NOT TAPE BETWEEN THE PRIMARIES!! IT SOON BECOMES ENGULFED FROM LIMB EXPANSION, RESULTING IN WEAK SCAFFOLD ATTACMENT AND POTENTIAL SPLITING**



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**THIS IS THE PROPER PLACEMENT OF THE TIE**



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THIS IS THE PREFERRED METHOD OF SECURING THE TREE HEAD TO THE STAKE



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It is often difficult to leave more than four primary scaffolds because there is not enough room in the circle of the vase shaped tree to accommodate them.



At least one, and possibly two have to be thinned off to allow adequate space for the upper branches.

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Here's the bigger view of the same tree. The #1 limb has to go; too strong and flat. Number 2 is upright due to the short primary, and well positioned. It's a keeper. Number 3 is facing into the wind, and in perfect position. Number 4 could be kept if it's not in the center of the canopy.



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Second year tree with four well distributed primary branches. Each has its own space to fill.



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Golden Hills after the second growing season. Note how the lower primary branches "choked out" the upper ones. Selecting the upper ones exasperates the over-pruning problem in young pistachios. Prune to VIGOR!



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**PISTACHIO DEVELOPMENT GOALS FOR THE THIRD SEASON:**

1. CROSS TIE MAIN BRANCHES AS NEEDED FOR IMPROVED UPRIGHTNESS OF PRIMARIES AND SECONDARY LIMBS.
2. MAXIMIZE GROWTH OF THE TERTIARIES AND OVERALL TREE GROWTH BY NOT PERFORMING ANY SUMMER TIPPING.
3. PREVENT NUTRITIONAL DEFICIENCIES! THEY KILL CANOPY DEVELOPMENT!
4. WINTER PRUNE CURRENT SEASON'S GROWTH TO ABOUT 18-22 INCHES. AVOID KNUCKLE CUTS WHICH WILL STOP LIMB DEVELOPMENT!

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DO NOT TIP THE TERTIARIES DURING THE THIRD SEASON! ALLOWING THEM TO GROW UNTIPPED BUILDS LIMB GIRTH THROUGHOUT THE CANOPY



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NOT TIPPING THE TERTIARIES DURING THE THIRD LEAF BUILDS LIMB GIRTH TO SUPPORT MORE UPRIGHT GROWTH AND BEARING OF EARLY CROP



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Second year Golden Hills where I tipped the secondaries in late July to get tertiaries. Note how thin the tertiaries are, and how many single shoots arose from trying to get greedy!



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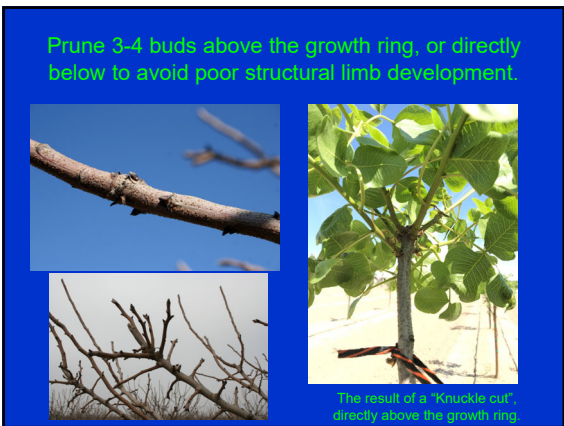
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Encourage pruners to select bud positions directly below their cut that create growth in the desired direction.



This cut directs growth outward. Such cuts are usually avoided on the structural branches, because they will naturally bend outward with years of cropping.



This cut directs the growth to either side of the branch, allowing for a more compact canopy. It is typically the preferred cut on structural limbs.

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"Long pruning" is sometimes a must to get canopy development in saline soils.



Cross tying limbs helps greatly in preventing flat structural branches.

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**PISTACHIO DEVELOPMENT GOALS FOR THE FOURTH THROUGH THE FIFTH SEASON:**

1. MINIMIZE THINNING CUTS TO IMPROVE EARLY BEARING POTENTIAL. THINNING CUTS REMOVE ENTIRE LIMBS AT THEIR POINT OF ORIGIN. THIS CUT IS PERFORMED MORE ON OLDER TREES.
2. WINTER PRUNE CURRENT SEASON'S GROWTH ABOUT IN HALF.
3. OPTIMIZE NUTRITIONAL STATUS IN PREPARATION FOR EARLY FRUITING
4. AVOID EXCESSIVELY LATE SEASON IRRIGATION TO PREVENT TENDER CURRENT SEASON GROWTH IN THE FALL. THIS WOOD IS SENSITIVE TO FALL FREEZES.

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THIS IS YOUR GOAL; A WELL TRAINED SIX YEAR OLD, READY TO MAKE YOU MONEY!



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## Successful Farmers Know:

1. What to do.
2. How to do it.
3. When to do it.
4. And then ... they do it !

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**THANK YOU!**

**QUESTIONS?**

**9<sup>th</sup> Advances in**  
PISTACHIO PRODUCTION

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