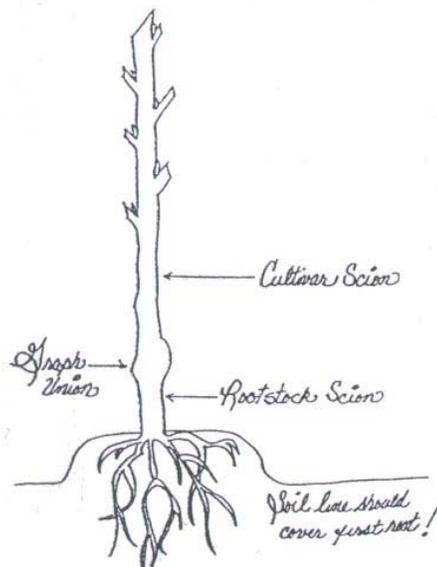


PLANT NEW TREES HIGH



By Brent Holtz, UCCE Madera County

One of the worst things that can happen to young trees from a nursery is that they are often planted too deep. Sometimes they are initially planted at the right height, but then a berm is thrown up around the trees and their crown (the graft union) is covered with the soil from the berm. I have observed many diseased trees with *Phytophthora* root and crown infections and most of them had their graft union below the soil line; sometimes the union was more than six inches below. If you are planting or replanting, trees should be planted high on small mounds as shallowly as possible. Planting depth after settling should be no deeper than in the nursery, and the graft union should always be well above the soil line (Figure 1). Try to follow some of these planting tips: 1) dig a hole deep enough so the roots age spread out

and not cramped, 2) plant the trees so that the nursery soil line is above the current soil line, 3) plant the highest root a little above the soil line and then cover it with extra dirt, and 4) when planting allow for 3-6 inches of settling in the planting hole. I have never seen trees die from being planted too high, but I have seen many trees killed by being planted too low.

Most soils in Madera County are heavy with high clay content. These soils have slow water percolation, drain slowly, and remain saturated longer than well-drained sandy soils. The mound around the tree trunk forces excess water to drain away from the tree, thus reducing the length of time the crown is exposed to excess surface moisture. Saturated soil conditions can occur at planting if the trees are irrigated too heavily, or when a high rainfall winter and spring occur. Some orchards survive years before a wet spring kills trees that settled too deep or had their crown covered with a berm. Plant the trees right the first time!

After making a strong case for planting the trees high, there is one exception. If you are planting on Marianna 2624 plum rootstock you should plant your trees the same depth they were planted in the nursery. With this rootstock, planting trees too high will cause them to sucker from the roots. Marianna 2624 is fairly resistant to *Phytophthora* and can also tolerate excess soil moisture better than other rootstocks.

ALMOND TREE PLANTING

By Mario Viveros, UCCE Kern County

The success of an almond orchard begins at the time of planting. There are few principles but many details. A detail may not be that important at the time of planting but it may be critical during the orchard's life. In the following paragraphs, we will consider important details at planting.

Soil – We have made the statement that almonds can grow well in deep, well-drained soil that is reasonably fertile and free of harmful salts. This statement can still be true, however, for almonds growing on shallow soils with the use of low volume irrigation systems. High quality water and soil amendments have allowed growers to reclaim saline-alkali soils. In the past these soils were classified marginal and not suitable for almonds, however with new technologies and excellent management these soils have become quite productive.

Fumigation is done to reduce nematodes. Ideally, if nematodes are present you want to reduce their population up to 99% for up to two years. This will allow the tree time to develop a healthy root system that can ultimately withstand or tolerate nematode damage. The decision to fumigate should be based on the presence of nematodes, crop history and rootstocks. In Kern County, we are mainly concerned with root knot nematodes, however we also have lesion and ring nematodes, which can be a problem. Nematode damage thresholds are not well established for almonds. As a general rule, if soil

analysis' identifies root knot nematode, ring nematode, or damaging species of root lesion nematodes on a site where almonds have been previously grown, fumigation is recommended before the site is re-planted to almonds. Be aware that a resistant root stock may not protect young trees when planted in heavily root knot nematode infested soil. Both Nemaguard and peach/almond hybrids are resistant to root knot nematodes but are susceptible to root lesion and ring nematodes

Time of Planting – Early plantings have been more successful than late plantings. January-February plantings are better than March. When trees are planted in January-February, ambient temperatures are low which prevents leaf buds from growing. This gives the roots time to callus and regenerate new roots before leaf buds begin to grow.

Root Pruning – The root system of trees from the nursery will contain some large roots and few small roots. Their length in most cases will be such that they can be handled at planting time. However, the normal tendency is to prune them back to such a length that it will fit into the planting hole. Excessive root pruning will reduce the amount of food stored in the root system. Therefore, a minimum amount of pruning is recommended at the time of planting. The only roots that should be pruned are those that have been damaged. They should be cut back at a sound place.

Root Inoculation should be practiced in planting fruit and nut trees. This will help in the prevention of crown gall which is a tumor-like disease that affects roots and the crown of trees. This disease not only decreases tree vigor but also opens the door to wood-rotting fungi. Once

the hardwood is rotten at the crown and root, the tree can be blown over by high winds. The roots can be protected by spraying the roots with a biocontrol agent. Galltrol® is one that is commercially available in the market. Please follow directions on the label

Size of the Hole – The hole should be just large enough to receive the roots without bending or crowding them if a soil auger is used, it should be 24-inches in diameter and the sides of the hole should be broken down to eliminate the auger's glazing effect. Compost or manure should never be placed at the bottom of the hole. It can create problems for the tree

Depth of Planting – Trees should be planted with the bud union above the soil line. The safest rule under ordinary circumstances is to plant the tree at the same depth it grew in the nursery. The reason being that the peach portion (rootstock) of the tree is more tolerant to *Phytophthora* than the almond portion (scion). Also, to prevent root and crown rot caused by *Phytophthora*, trees should be established on raised berms.

Soil-root Contact – Direct contact between roots and soil is an essential part of a successfully planted tree. To accomplish good soil-root contact, the worker must get down on his knees and firm the soil under and around the roots with his fingers. You should not permit the worker to use his shoes to firm the soil around the roots. This can injure the roots and trunk. Remember, injuries can lead to crown gall infections. Once the soil has been packed around the roots, set the soil with water to insure a good soil-root contact and eliminate air pockets.

Soil Moisture – The field should be dried or contain seedbed moisture conditions at the time of planting.

Once the trees are planted special effort should be made to insure good soil moisture around the root zone.

Tree Orientation – Trees are usually planted with the bud growing into the wind. There have been no major problems with this practice; however, problems are created when we leaned trees too much into the prevailing winds. In fact, there have been trees leaned at 40 degrees. When trees are leaned this much, the trunk develops a curvature at the base and shoots develop only on the southeast side of the trunks. This creates a lopsided tree that is difficult to balance at pruning time. To prevent this problem, trees should be leaned only at 20 degrees.

Fertilization – Fertilization at planting time is not recommended since the tree contains enough nutrients for root and initial shoot growth. Nitrogen fertilization should be delayed until shoots are about 4 to 6 inches in length. At this time, four ounces of commercial nitrogen fertilizer per tree should be placed 18 inches away from the trunk. This practice should be repeated two or three times during the growing season.

Prevent Root Dehydration – This is one of the most important points in tree planting. Special procedures must be in-place to prevent moisture loss from roots. This is especially true when planting the peach-almond hybrid rootstock. The roots should always be kept moist during the planting operation. We should avoid the practice of distributing trees by the planting hole, and then returning to plant the tree an hour later. This practice may expose roots to dehydration, which in turn may lead to poor tree growth.

SURVIVAL AND GROWTH OF FALL TRANSPLANTED POTTED ALMOND NURSERY TREES COMPARED TO SPRING TRANSPLANTED BARE ROOT TREES

By Wilbur Reil, UCCE Yolo & Solano Counties

Almond trees on peach-almond hybrid rootstock have been difficult to transplant and grow if the bare root trees are planted in mid to late spring from nursery trees stored in cold storage. In some cases losses have been 20 to 40 %. Many years on loam and silty clay loam soils the ground is too wet to plant earlier than late spring. There are also times that growers do not complete ground preparation in the preceding year to have an ideal planting bed. Therefore, sometimes the ground must dry out in the spring to complete soil preparation before planting. One nursery currently has been growing nursery trees in containers and selling the potted trees for transplant into the orchard at any time of the year. I started a trial 4 years ago to evaluate planting potted tree transplants in the fall compared to winter or spring planted bare root nursery trees.

The trial is on Class I silty clay loam in Yolo County. The orchard site previously was planted to almonds. The experimental design is a randomized complete block of five replicates of four trees per replicate. There are two treatments (potted vs. bare root trees) and three varieties (Nonpareil, Sonora and Butte). The five-month-old growing potted trees were planted in September 28, 1998 and the bare root 5/8 inch dormant trees were planted in late January 1999. All trees were headed at 36 to 38 inches.

At the end of the first growing season the length of the three longest shoots that were selected for the primary scaffolds of the tree was measured. Results are shown in Table 1.

Table 1. Average length of each of the 3 longest scaffolds per tree at the end of the first year of growth.

	Potted		Bare Root	
Nonpareil	164.3cm.	4.6ft.	134.5cm.	4.4ft
Butte	135.2	4.4	136.2	4.5
Sonora	131.2	4.3	125.8	4.1
Average	135.2	4.4	132.2	4.3

During the winter following the first, second, third and fourth growing seasons the trunk circumference was measured at 14 inches above the ground. The measurement was then converted to trunk cross sectional area. Results are shown in Table 2.

Table 2. Average square centimeters of trunk cross sectional area measure approximately 14 inches above ground level at the end of each growing season.

<u>Year</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>
Nonpareil	17.8	59.7	110	191	15.1	55.2	104	194
Butte	14.9	63.2	121	221	14.6	62.0	121	116
Sonora	18.3	66.8	130	241	13.1	56.5	119	215
Average	17.0*	63.3*	121	218	14.3	57.9	112	212

*Statistically significant – LSD .05

Yield was taken on the Nonpareil and Butte in 2002. Sonora bloomed about 5 days before Nonpareil and set a very small crop due to the poor bloom overlap. No yield was harvested from the Sonora trees. Yield data s shown in Table 3.

Table 3. Average pounds production per acre for 200 from the Nonpareil and Butte Cultivars.

	Year	2001	2002
Nonpareil		226	218
Butte		466	435
Average		346	327

Growth measurements in October 1999 showed no statistical differences between the potted trees and the bare root trees in shoot length. The total length of the 3 longest scaffold limbs showed that the potted trees had grown an average of 406 cm. (13.3 feet per limb) for the bare root trees. Average potted tree trunk cross sectional area in

1999 was statistically significant at 17.0 sq. cm. compared to 14.3 sq. cm. for the bare root trees showing that the potted trees had attained a larger trunk thickness. Trunk cross sectional area was also significantly larger for the potted trees (63.3 sq. cm.) in 2000 compared to the bare root trees (57.9 sq. cm.). In 2001 and 2002 the trunk cross sectional area showed no significant differences between the potted and bare root trees (121 vs. 112 and 218 vs. 212 sq. cm.)

Growth and height of the potted and bare root trees look the same. You cannot view the trial and separate the nursery-potted trees from the bare root trees.

While there was a slight numerical difference there was no statistical significant difference between yields. Butte yields were the highest showing the excellent pollination they received from the Nonpareil trees in the trial. Sonora yield was very disappointing. The earliness of bloom with no Nonpareil pollen available for several days after they started blooming probably caused the crop failure.

One bare root tree died whereas no potted trees died due to transplanting. The bare root trees were not placed in cold storage. Planting of the bare root trees occurred shortly after digging from the nursery. Originally the trial was set up to compare the potted trees planted in September to bare root trees that were going to be planted in late March or April, after the bare root trees were dug and placed in cold storage. There was a window in January 1999 where weather was ideal for planting so the trial was modified to take advantage of the good planting conditions. This window does not occur every year in Yolo Co.

On an adjoining block the grower planted several rows of potted nursery trees and also block the grower planted several rows of potted nursery trees and also several rows of bare root trees that had been in cold storage approximately 3 weeks until they were planted in mid-March. Survival was observed on a random 200 trees in each section. While it is not a replicated trial the observation showed that 4 trees out of 200 died in the bare root section (2%) and no trees died in the potted tree section.

Based on these trials it appears that trees planted as potted trees in the fall performed equally with bare root trees planted during the winter. While the potted trees grew slowly the two months before going dormant they grew very vigorously the following spring. Trunk diameter after one year was equal to the bare root trees even though the potted trees had a small trunk caliper at planting. Some of both the potted and bare root trees needed to be staked to maintain a straight trunk. Planting potted trees gives another option to growers especially when planting on soils that cannot always be planted during the winter months due to rain or extremely wet soils.

Winter Tree Fruit Meeting
December 4, 2002
Dinuba Memorial Hall, 249 S. Alta, Dinuba

8:00 – 8:30 AM	Registration – Pre-registration required
8:30 – 8:40 AM	Welcome and Industry Funded Research Activities Update <i>Kevin R. Day, Tulare County Farm Advisor</i>
8:40 – 9:00 AM	Control and Management of Bacterial Canker <i>Beth Teviotdale, Plant Pathologist, Kearney Ag Center</i>
9:00 – 9:20 AM	Nutsedge Biology and Control <i>Steve Wright, Tulare County Farm Advisor</i>
9:20 – 9:40 AM	Identification and Correction of Common Nutrient Deficiencies <i>Robert H. Beede, Kings County Farm Advisor</i>
9:40 – 10:00 AM	Ten-Lined June Beetle Biology <i>Rich Coviello, Fresno County Farm Advisor</i>
10:00 – 10:30 AM	Break
10:30 – 11:00 AM	Rethinking Orchard Systems and Management to Maximize Profit Rather Than Yield <i>Ted DeJong, Pomologist, UC Davis</i>
11:00 – 11:30 AM	Pest Management Alliance Review – What We've Learned Over the Past Three Years about San Jose Scale and Katydid <i>Walt Bentely, IPM Advisor, Kearney Ag center</i>
11:30 – Noon	When to Harvest Blackamber Plums – A Postharvest/Consumer Perspective <i>Carlos H. Crisosto, Postharvest Specialist, Kearney Ag Center</i>
Noon	LUNCH Catered by the Safari Club Restaurant, Dinuba

3 Hours of Continuing Education Credit applied for

2002 Almond Meeting

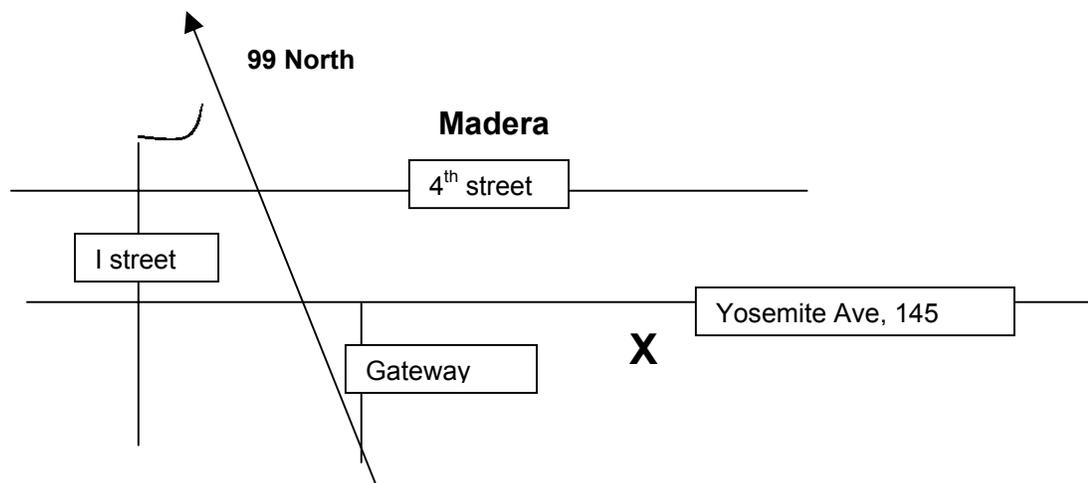
Tuesday, December 10, 2002

Madera County Conference Center, 700 E. Yosemite Ave, Madera

8:00 AM-12:00 Noon

- 8:00 a.m. PCA and continuing education credits sign-up
- 8:20 a.m. **Almond leaf scorch disease diagnosis**
Dr. Brent Holtz, UCCE Farm Advisor, Madera County
- 8:30 a.m. **Regional Almond variety trials**
Dr. Bruce Lampinen, Almond and Walnut Specialist, UC Davis
- 9:00 a.m. **Weed control in almond orchards**
Ron Vargas, UCCE Farm Advisor & County Director, UCCE Madera
- 9:30 a.m. **Ten Lined June Beetle Identification & Control**
Rich Coviello, UCCE Farm Advisor, Fresno County
- 10:00 a.m. Break
- 10:15 a.m. **The effect of Kaolin (Surround) on Carmel bloom, fruit set, and yield**
Dr. Brent Holtz, UCCE farm advisor, Madera County
- 10:30 a.m. **Pre-plant fumigation for nematode control**
Dr Mike McKenry, Nematology Extension Specialist, UC Riverside/KAC
- 11:00 a.m. **Wood chipping almond brush and its effect on the nematodes, soil aggregation, and soil nutrients**
Dr. Brent Holtz, UCCE farm advisor, Madera County
- 11:30 a.m. **Ground squirrel and gopher control**
Mark Freeman, UCCE farm advisor, Fresno County
- Noon– Adjourn

2.5 hours of PCA, CCA and Private Applicators Credit have been requested. A **free lunch** will be served by the Madera County 4-H, sponsored by the University of California, Engelhard, Dow Agro Sciences and BASF
Please RSVP Sandra at 559-675-7879, Ext. 201



From the north take 4th street exit, go south on I St., and east on Yosemite (Hwy. 145 East).
From the south, take Gateway Exit, go north until Yosemite (Hwy.145), then go east.

UPCOMING EVENTS

February 20, 2003 Understanding Salinity Diagnosis and Management in Tree Crops, Four Points Sheraton Hotel, 5101 California Avenue, Bakersfield. 9:00 a.m. to 5:00 p.m. Topics will include units of concentration on and definitions, how to read and interpret a soil and water report, the effects of salinity on soil, water and plants and managing salinity in tree crops. Enroll online: www.extension.ucdavis.edu.

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Sincerely,

Brent A. Holtz, Ph.D.
Pomology Farm Advisor

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