



Reducing Costs in Almonds



yielding orchard and have included a 1000 pound orchard as a lower input orchard. Individual grower expenses may vary from this hypothetical farm. I hope that I can stimulate your thoughts towards where you might reduce costs without affecting the short term return and also where cost cutting could seriously reduce the short or long term return.

A Practical Guide to Orchard Cost-Cutting

by Wilbur Reil, Yolo and Solano Counties Farm Advisor

Almond growers are experiencing tight economic pressures these days. Costs continue to increase while the returns have dramatically decreased the last year. Growers are continually trying to find ways to reduce costs or receive higher prices for their crop. In order to look at areas that growers could reduce costs or increase returns a typical or hypothetical farm needs to be considered. For a typical farm I am using the "1995 UC Cooperative Extension Sample Costs to Produce Almonds" that is available at Cooperative Extension Offices. I have made no adjustments on costs although some costs have increased. Labor costs are estimated to be about 15% higher and other costs about 6 or 7% higher than in 1995.

The almond cost study is divided into sections on cultural, harvest, overhead and investment costs. The cost study is based on the orchard producing 2000 meat pounds. To better illustrate two orchards I have used the 2000 pound yield as the high

Figure 1

Operation	1000 Pound	2000 Pound
Cultural	\$517	\$924
Harvest	\$244	\$314
Overhead	\$205	\$215
Investment	\$452	\$452

Figure 2

Operation	1000 Pound	2000 Pound
Cultural	\$.52	\$.46
Harvest	\$.76	\$.64
Overhead	\$.97	\$.73
Investment	\$1.42	\$.95

Figure 1 shows the almond orchard cost for a 1000 and a 2000 pound per acre yield for the four general categories. From the figure the cultural costs are much lower and the harvest costs are somewhat lower for the orchard with the lower crop. Very little reduction is shown in the overhead and no reduction is shown in investment cost. The investment was made several years ago in land cost, the irrigation system and planting and no reduction is shown in

investment cost. These costs continue and are basically the same for a high producing or a low producing orchard. The overhead expenses of office, insurance, worker safety training, property taxes and investment repairs will not change. The only change that decreases the cost some on the low yield orchard is operating expense interest that I included in overhead.

The two operations that have some changes in costs are harvest and cultural. Harvest cost can be reduced in hauling and in hulling because you are handling only half as much crop and it will require only half the time. Shaking, sweeping, hand raking and pickup will still require the same time because the same number of trees need to be shook and the same area of ground is swept and picked up. Cultural costs can also be reduced and will be commented on later.

Figure 2 shows the accumulated costs per pound of nuts based on the 1000 and 2000 pound yield. The cultural costs are not too much different between the two orchards. Some difference occurs in harvest costs. The major differences in cost per pound occur under overhead and investment operations. Under these two categories the cost per pound is double under the low yield.

As shown in Figure 1 you can decrease cultural and harvest costs some if you are producing a smaller crop. As shown in Figure 2 this decrease cost per acre does not translate in decreased cost per pound of nuts produced. In fact just the opposite is true. Also the overhead and investment costs cannot be decreased. Therefore, if you want to minimize your cost per pound of nuts produced you need to maximize your yield as much as possible without increasing costs.

Figure 3		
Operation	1000 Pound	2000 Pound
Winter Sanitation	\$••	\$81
Pruning & Brush Removal	\$54	\$108
Insect Control	\$39	\$78
Disease Control	\$66	\$66
Weed Control	\$62	\$72
Pollination	\$50	\$100
Fertilizer - Nitrogen	\$50	\$71
Potassium	\$••	\$69
Insect Control	\$90	\$115
Other	\$106	\$145

Figure 3 shows the cultural costs for an almond orchard

yielding 1000 pounds compared to an orchard yielding 2000 pounds. I have tried to decrease the costs where I believe growers can save money. Some of the cost savings can also be temporarily used for growers that are still producing 2000 pounds without adverse effects. I will make additional comments on several of these cost saving areas later.

Winter sanitation is needed to reduce the overwintering host for navel orangeworm. If mummies are not present in the orchard or if a large bird population cleans the trees after harvest it is not necessary. Several growers pole the trees at harvest and harvest the nuts at the same time as the rest of the crop or will harvest the Nonpareils and then reshake them at the same time they harvest the other varieties. Generally the off-type nuts will be under the 10% tolerance so will not affect the grade. While the double shake or the hand poling does not make much money it usually is a "break even" operation instead of an \$81 cost in the winter with no return. Generally it is much easier to pole smaller trees. Large trees usually require shaking in the winter.

Reducing the number of mummies left on the tree at harvest can favorably impact winter sanitation. Proper service and operation of the shaker will improve removal. Harvesting at the ideal time also helps. Irrigation and tree moisture status at hull split and at harvest can also be critical. This will be discussed under irrigation.

Pruning is one area wherein substantial savings can occur especially on young bearing orchards. Newly planted trees need to be pruned properly for the first three years. Trees for the next 6 to 10 years could probably be pruned every third year or less often with only broken limbs and suckers removed in years when no pruning is done. Older trees could also be pruned on an alternate year pruning or less often as long as excellent vigor is maintained in the orchard. While I have indicated the cost savings under the 1000 pound list the same savings could also be achieved with the higher production orchard at least for the short term. Pruning is probably the area that costs can be reduced with a corresponding large money savings.

A newer tool that may increase productivity or efficiency of the workers is the gas powered chain saw on a pole that allows the worker to saw fair-sized limbs 10 to 15 feet in the air. Also, hedging machines have been used in a few cases to help rejuvenate growth in older orchards.

The cost study shows two sprays for insects: a dormant spray and an inseason worm spray. The dormant spray will control the peach twig borer, European Red Mite, Brown Mite, and San Jose scale. If these mites and scales are not problems the dormant spray could be substituted by Bt and achieve some cost savings in several ways. Almond trees require full ET irrigation in the spring and early summer to maximize crop load, nut size and vegetative growth where next year's crop will set. Therefore, we need to make sure the trees are not stressed before hull split. Trials have shown that almonds that are somewhat stressed at early hull split are easier to knock, have less hull rot and have less mummies that need to be removed. There is also some savings on water from the reduced irrigation needed. Irrigation systems require different management strategies to achieve the mild stress desired. Drip systems can be reduced to 50% ET at first hull split for about 3 weeks to achieve the desired effect. Micro and solid sprinkler systems must be reduced earlier to achieve the partial stress. The grower must know his/her soil, the amount of water the soil contains, be able to judge when to reduce the irrigation soon enough to achieve a 50% stress on the trees at early hull split. Irrigation can also be reduced some after harvest to achieve water savings.

Some of the other costs can achieve temporary savings. Not replanting lost trees in the orchard will save money today but cost you in lost production in 5 or 6 years. I don't advise it unless the orchard has only a 6 to 8 year life expectancy.

Crop consultants or PCAs who charge for their services are an expense but they usually can save a grower money or prevent insect, disease or nutritional problems that will cost a grower lost or damaged crop.

Pickup and ATV costs as well as cellular phone costs also are a part of the "other" category. Now we can't do without them but we got by with much less only a few short years ago. Can we decrease a trip here or there and run the pickup another year without costing us increased repair?

It will usually save money at harvest if breakdowns can be avoided or kept to a minimum. Keep equipment in good repair and do the repair early before harvest time. If you have a huller that is slowing down the harvest, stockpile some of the almonds and then fumigate them. Fumigation will stop any worm problems.

Stockpiling will also give a steady supply to the huller in case of harvest equipment failure or in case of rain.

I hope I have stimulated some cost saving ideas for you. Not all the ideas are practical and useful to every grower. Consider your operation and go through each operation. You may already be achieving cost savings greater than what I have suggested. If it is working well for you continue your current practices. Don't fix it if it isn't broke. In other areas perhaps an adjustment may save you some money or improve efficiency.

Dual Variety Row Almond Production

by John Edstrom UCCE Farm Advisor, Colusa, Sutter and Yuba counties

Today's almond orchards involve closer spacings to maximize early returns. However, tighter spacings tend to exaggerate the development of a floral "wall" during blooms. This can decrease cross row bee activity and limit cross pollination. At the same time, expansion of statewide almond acreage is creating more demand for bees, while mite parasites, Africanized bees, and fire ant problems all threaten bee supplies. Supplies of strong hives are particularly stretched. Increased world supplies of almonds may lower prices and further pressure production efficiency. In this new era of almond growing, optimal pollination management and innovative orchard designs become even more important.

For the past eight years at the Nickels Soil Lab, a field trial has evaluated the orchard design strategy of alternating two varieties down the same hedgerow. While not a new concept, the availability of Padre as a variety to market mixed in with Mission gave us a good combination to evaluate. Solid rows of Padre are compared to solid rows of Mission versus rows alternating with Padre and Mission (M•P•M). Buttes are planted solid in alternate rows as the primary orchard variety. All trees are on Lovell peach rootstock at a 15 foot by 20 foot spacing for 145 trees per acre on Class II soil, single hose drip irrigated.

Four consecutive early harvest have shown a yield advantage to alternating Mission and Padre down the same row. Data show an increase in yield for this

design versus the average yield of solid rows of Mission and solid rows of Padre. The accumulative figure shows a 9 percent yield advantage to alternating during the first four years of this trial.

Yield for Padre in 1996 shows a 14 percent increase when alternated, but Mission showed little yield increase from alternating that year. Production in 1997 did not show any advantage for dual rows.

In 1998, yields showed a 300-pound-per-acre advantage for Padre in M•P rows versus solid Padre rows, again about a 10 percent increase. But, again Mission did not gain in yield from the alternating design. (Measurements of tree trunks and canopy sizes do not indicate encroachment of Padre trees into the space of the weaker Missions.)

Weather patterns at bloom seem to help explain these seasonal variations. During years of significant rain at bloom, the advantage of dual rows is at its highest, but during dry periods we find little or no advantage.

This orchard design seems to have a stabilizing effect on production from year to year. If this holds true, we can add production to "off" years when crop returns are likely to be higher per pound. The advantage with dual rows would amount to be greater in dollars than the 8 percent to 10 percent yield increase would indicate.

The effect of 50 percent Butte in this block seems to be interfering with the alternating effect. Using a new genetic lab analyses method (isozyme analysis) to determine male pollen parentage, we found that Padre nuts in alternating rows were pollenized by Mission 55 percent and Butte 40 percent, while Padre in solid rows had 30 percent Mission pollen and 65 percent Butte parentage. Butte pollen is adding a lot to the set in all rows but more so in the solid row and so is diminishing the effect of Mission pollen in the dual row.

The benefit of alternating two varieties down the same row could be even greater if only two varieties were planted in the block. Here, where Buttes are planted in every other row, the Butte pollen is responsible for much of the Padre (and Mission) set thus limiting the advantage of alternating. Orchards with just two varieties could benefit more than this data shows.

Due to the stick tight problem when harvesting the Padre variety late, we cannot accomplish a once-over harvest operation. Padre nuts require earlier shaking than the Mission to get acceptable nut removal. Two passes down the same row with a shaker is needed on the alternating M•P rows. Sweeping and pickup operations are done in a single pass combining the two varieties. Handlers generally accept P•M loads as Missions.

Other varietal combinations may appear more desirable in

terms of yield but may lead to more harvest difficulties or result in mixed loads. Butte/Padre, Nonpareil/Carmel and other pairs would be more desirable than Mission/Padre, but cause greater problems at harvest when planted in the same row.

Table I. Multi Variety Rows – Yields-Lbs/ac					
Year	1993	1994	1995	1996	
Leaf	5 th	6 th	7 th	8 th	Avg.
Mission-Padre	1831	1776	1705	1843	1788a
Mission-Padre Alt.	1921	1948	1916	2000	1954b
Increase	+5%	+10%	+12%	+8.5%	

Table II. 1996 YIELDS LBS./AC			
	Solid Rows	Two Variety Rows	% Increase
Padre	1966	2240	14%
Mission	1720	1757	2%

TABLE III. DUAL VARIETY ROWS – YIELDS LBS./AC						
Year	1993	1994	1995	1996	1997	1998
Leaf	5 th	6 th	7 th	8 th	9 th	10 th
Solid	1831	1776	1705	1843	2227	2164
M•P•M•P	1921	1948	1916	2000	2235	2180
	+5%	+10%	+12%	+8.5%	0	0

Please email me!!!!

In this era of electronic communication, I can email fruit and nut growers pertinent information as I obtain it, without the hassle of printing 700 newsletters. If you have access to email, please send me a quick note so I can create a tree fruit and nut list serve to send back information to growers. Don't worry, I will not give out your email to other people or organizations, and I will continue to publish the Pomology Post. Please specify in your email what fruit or nut crops you are interested in. My email is:

baholtz@ucdavis.edu

8th Annual Madera County Almond Day

Tuesday, February 5, 2002

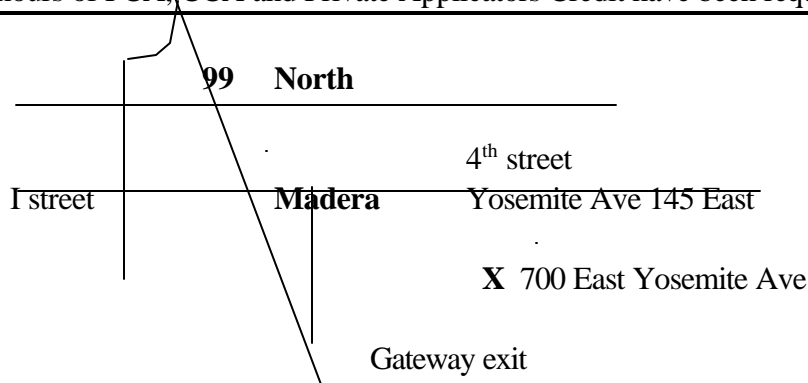
Madera County Conference Center, 700 E. Yosemite Ave, Madera

8:00 a.m. - 12:00 Noon

- 8:00 a.m. PCA and continuing education credits sign-up
- 8:15 a.m. **Welcome**
Brent Holtz, Pomology Farm Advisor UCCE Madera
- 8:20 a.m. **Ant Control in Almond Orchards**
Rich Coviello, UCCE Entomology Advisor Fresno
- 9:00 a.m. **Navel Orange Worm and Peach Twig Borer and How Their Biology Influences Control**
Walt Bentley, IPM Advisor, Kearney Agricultural Center
- 9:30 a.m. **Management of Hull Rot Disease on Almonds**
Dr. Beth Teviotdale, Extension Plant Pathologist, KAC
- 10:00 a.m. Break
- 10:10 a.m. **Almond Production Strategies to Ensure Food Safety**
Tom Krugman, Almond Board of California
- 11:00 a.m. **Ground Squirrel Control in Almond Orchards**
Dr. Desley Whisson, Extension Wildlife Specialist
- 11:30 a.m. **Wood Chipping Almond Brush and Pruning Out Almond Leaf Scorch Infections**
Brent Holtz, Pomology Farm Advisor UCCE Madera

Noon– Adjourn

3.5 hours of PCA, CCA and Private Applicators Credit have been requested.



From the north take 4th street exit, go south on I, and east on Yosemite, 145 East

From the south, take Gateway exit, go north until Yosemite 145, then go east.

Walnut Weed Control Study 2001
Brent Holtz, Ron Vargas, Tomé Martin-Duvall and Eric Hoffman
University of California Cooperative Extension

A five year old Chandler walnut orchard on a 22.5 by 22.5 ft spacing was divided into four replications of 12 treatments with 2 trees per plot in a randomized complete block design. Treatments were applied on January 31, 2001 with a CO₂ backpack sprayer delivering 20 gpa at 40 psi through 3 - 8002 flat fan nozzles. Evaluations of weed control were taken at 40, 96 and 148 days after treatment (DAT). Crop injury was evaluated throughout the season.

There was no evidence of crop injury from application to harvest. At 40 DAT, all treatments provided excellent control of all weeds present. At 96 DAT, tank mixes of Roundup Ultra with both formulations of Chateau, all rates of Milestone, Goal and Surflan provided greater than 90 % control of marestalk. All treatments except the tank mix of Shark and Goal exhibited over 90% control of fleabane, greater than 88% control of spotted spurge, and greater than 84% control of prostrate pigweed. At 148 DAT, only Goal and Visor exhibited less than 90% control of marestalk at 87%. Fleabane control was greater than 80 % for tank mixes of Roundup Ultra with both formulations of Chateau, all rates of Milestone, Goal and Surflan. Johnsongrass control was at 90% or greater with tank mixes of Roundup Ultra with Chateau 50W, all rates of Milestone, and the tank mix of Goal and Visor. Effective nutsedge control was only exhibited with the tank mixes of Roundup Ultra with Milestone at 7.5, 15, and 20 oz/A, and Goal with Surflan.

Treatment	Rate/Acre	Weed Control	Marestalk Control		Fleabane Control		Spotted Spurge	Prostrate Pigweed	Johnsongrass	Nutsedge
			96 DAT	148 DAT	96 DAT	148 DAT				
1. Milestone + RU	7.5 oz + 1 pt	100 a	96 a	96 ab	94 a	88 a	100 a	98 a	95 a	93 a
2. Milestone + RU	10 oz + 1 pt	100 a	95 a	96 ab	94 a	92 a	100 a	100a	98 a	72 abc
3. Milestone + RU	15 oz + 1 pt	100 a	98 a	92 ab	98 a	85 a	100 a	96 a	95 a	92 ab
4. Milestone + RU	20 oz + 1 pt	100 a	98 a	93 ab	95 a	92 a	100 a	100 a	95 a	97 a
5. Milestone + Goal + RU	7.5 oz + 1 qt + 1 pt	100 a	91 ab	90 ab	95 a	82 a	100 a	99 a	90 a	30 cd
6. Goal + Visor	2 qt + 1.5 qt	100 a	92 a	87 b	95 a	62 a	100 a	99 a	100 a	52 abc
7. Shark + Goal + Agridex	0.8 oz + 2 qt + 1%	99 b	83 c	90 ab	77 b	48 b	73 b	57 b	75 ab	40 cd
8. Chateau 4F + RU	12 oz + 1 pt	100 a	98 a	95 ab	94 a	82 a	100 a	100 a	78 ab	42 cd
9. Chateau 50W + RU	0.75 lb + 1 pt	100 a	96 a	98 a	94 a	88 a	100 a	98 b	90 a	35 cd
10. Rely + Goal + COC	1 Gal + 2 qt + 1%	100 a	85 bc	95 ab	97 a	65 ab	93 a	85 a	50 b	48 bc
11. Goal + Surflan + RU	2 qt + 1 qt + 1 pt	100 a	92 a	92 ab	95 a	83 a	89 ab	88 a	52 b	93 a
12. UTC		0 c	0 d	0 c	0 c	0 c	0 c	0 c	0 c	0 d

Tri-County Walnut Day
February 7, 2002, 8:00 a.m. - 1:00 p.m.

Visalia Holiday Inn

contact Bob Beede 559-582-3211 ext 1-2737

- 7:00 a.m. Registration/Pick Up Tickets for Lunch
 8:00 a.m. Welcome
 8:10 a.m. **CA Walnut Commission Activities**
 Dennis Balint, CEO, and Susan Haenny, Market Director, CA Walnut Commission
 8:40 a.m. **Crown Gall & Branch Wilt: Causes for Infection & Control Measures**
 Dr. Beth Teviotdale, Extension Pathologist, Kearney Ag Center
 9:10 a.m. **Water & Walnuts: Understanding Uptake, Crop Requirement & Stress Effects**
 Dr. David Goldhamer, Irrigation Specialist, UC Davis
 9:40 a.m. **Understanding the Walnut Replant Problem**
 Dr. Mike McKenry, Extension Nematologist, Kearney Ag Center
 10:10 a.m. BREAK
 10:30 a.m. **Codling Moth: How Pest Resistance & EPA Affects Your Management Strategy**
 Dr. Bob VanSteenwyk, Extension Entomologist, UC Berkeley
 11:00 a.m. **Training & Hedging Young Walnuts for Production & Profit**
 Bill Olson, UCCE Farm Advisor, Butte County
 11:30 a.m. **Prioritizing Production Practices in Tough Times**
 Bob Beede, UCCE Farm Advisor, Kings County
 12:00 p.m. LUNCH
 12:30 p.m. Luncheon Speaker
 Codling Moth Management: The New Frontier of Pheromone Confusion
 Don Thomson, DJS Consulting, Seattle, Washington
 1:00 p.m. ADJOURN
 2 hours of OTHER continuing education credit

REGISTRATION FORM

Registration must be received by:
 February 1, 2002

Please detach and mail this form with a check made payable to UC REGENTS

Cost: \$6.00/person, includes lunch

Mail to: UC Cooperative Extension
 TRI-COUNTY WALNUT DAY
 4437-B South Laspina Street
 Tulare, CA 93274

Name: _____
 Company: _____
 Address: _____
 City/State/Zip: _____
 Day Phone: _____
 Amount Enclosed: _____

If reservation is for more than one person, please list names of others covered by check

OFFICE USE ONLY

DATE: _____ CHECK#/CASH: _____

RECEIPT #: _____ AMOUNT: _____

RECEIVED BY: _____

Coming events

2002 Annual Statewide Pistachio Day, Tuesday, January 29, 2002, 9:30 AM-3:00 PM, Visalia Convention Center, 303 E. Acequia, Visalia, CA. PCA & CCA credit has been requested. A buffet deli-style lunch will be available between the morning and afternoon sessions for \$10/person. To register call the California Pistachio Commission at 559-221-8294 or email: info@pistachios.org

Southern San Joaquin Valley Prune Day, February 28, 2002, contact Brent Holtz 559-675-7879 x209, Harry Andris 559-456-7557, or Maxwell Norton 209 385-7403.

UC Davis Extension Courses:

Medicinal Herb Production, Jan 30 & 31, UC Davis, \$275.

Varietal Winegrape Production Short Course, Feb 12-14, 16.5 PCA & CCA credit, \$575.

Edible Mushroom Cultivation, March 2&3, UC Davis, \$275.

Understanding Agricultural Leases, March 23, UC Davis, \$165.

Designing an efficient landscape irrigation system, Feb 26&27, UC Davis, \$380.

Fundamentals of Biotechnology, Jan 26 & Feb 2, UC Davis, \$295.

For more information or to enroll, call 1- 800-752-0881 or go online www.universityextension.ucdavis.edu.

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Sincerely,

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