

State of California
The Resources Agency

Memorandum

To: California Board of Forestry and Fire Protection **Date:** November 26, 2024
Telephone: 530-379-5085
Website: www.fire.ca.gov

From: Stewart McMorrow, Staff Chief Wildfire Resilience
Reforestation Services Program
Resource Management
California Department of Forestry and Fire Protection (CAL FIRE)

Subject: Proposed new hardwood seedling prices at LAMRC.

Background

CAL FIRE's Reforestation Services Program (RSP), based out of the Lewis A. Moran Reforestation Center (LAMRC) in Davis, produces approximately 250,000 containerized seedlings per year primarily for reforestation on non-industrial, privately-owned forest lands in California. We are also authorized and mandated to produce seedlings for other conservation purposes, such as wildlife habit improvement, soil erosion control and watershed protection, per Public Resources Code (PRC), Sections [4681](#) and [4683](#).

Since reopening the nursery in 2018, and due to several catastrophic wildfires in subsequent years, our efforts and priorities have been focused on producing conifer seedlings for post-fire reforestation. Many customers are reforesting not with the intent to harvest trees in the future, but to merely reestablish the forest environment to pre-fire conditions. For this reason, many customers have submitted requests to purchase seedlings other than commercial conifers. In response, the nursery has revived, on a limited basis, the hardwood propagation program that ceased in 2003, when the nursery closed.

Consistent with California Board of Forestry and Fire Protection (BOF) [Forest Management Policies](#) (specifically section 0353 – Nurseries) "*CAL FIRE shall determine appropriate pricing for all nursery products based upon market prices, but which are adjusted such that they do not disadvantage existing private nurseries or are overly burdensome to purchasers. Pursuant to PRC § 4684, CAL FIRE's pricing schedule is subject to Board consideration and approval, as are any adjustments or amendments that are made to that schedule. (0353.3 - Pricing)*". In conducting a market analysis of

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current retailers, the overarching goal maintained that our revised prices are not seen as competition.

The following information describes the analysis and procedures used to determine appropriate hardwood seedling prices for our customers.

Cost of Production Considerations

Native hardwoods are much more costly to produce than are conifers, necessitating a higher pricing structure for sales. Major considerations are:

- **Square footage of space required.** Hardwoods generally require 2-4 times the growing area for a given number of plants, as compared to conifers. This is due to their spreading canopies and aggressive root systems which require larger containers.
- **Irrigation costs.** The automated, efficient overhead irrigation boom system used for conifer production is not compatible with hardwood production. Hand watering with a wand is required for hardwoods, to deliver water under the spreading foliage, as well as to accommodate differing irrigation frequencies, depending on species. This is very time and labor intensive.
- **Pest management.** Hardwood seedlings experience many common disease and insect issues, requiring a higher level of pest control activities than conifers. Diseases such as leaf spot, twig die-back and powdery mildew are common occurrences, as are insect issues with aphids, whiteflies, mites, and fungus gnats. Aside from the direct damage insects do, they are often vectors for disease organisms.
- **Economy of scale.** The larger the quantity of an item produced, the lower the associated unit cost of production will be. This is important in two ways. First, when comparing the costs of production between conifers and hardwoods. Second, when comparing CAL FIRE prices to those charged by private nurseries. Hardwoods grown in private nurseries are generally produced and sold in small quantities as compared to reforestation/restoration nurseries. A smaller scale of production necessarily results in higher production costs per unit, resulting in a higher purchase price for the customer.

Methods of Price Analysis

In determining appropriate prices for hardwood seedlings grown at LAMRC, two strategies were considered and analyzed.

- 1) Use historical data from LAMRC hardwood seedling sales between 1989 and 1999 and inflate those figures to 2024 dollars. Prices charged in those years were based on this facility's specific costs of production and were approved by the Board of Forestry and Fire Protection at that time. See attached spreadsheet tab, "Previous Prices in 2024 \$\$".
- 2) Survey prices charged by private nurseries selling native plants of California, then price CAL FIRE's at the upper 25%, to avoid the perception of unfair competition. To this end, a price survey was conducted of approximately 70

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private nurseries in California in spring to fall, 2024. See the “[Private Nursery Price Survey](#)” and “[Upper 25% Calculations](#)” tabs.

Findings and Assessment from Nursery Retailers

Over many months in 2024, numerous contact methods were utilized to discern current sales practices of hardwood seedling growers in California. Routine questions would be asked on stock sized used, species cultivated, order quantities, customer types, and prices charged. Using a historic listing of retailers the program has maintained, calls, emails and internet searches (including review of the only statewide well-maintained, US Forest Service-managed reforestation directory ([RNGR.net](#))), dozens of entities were sought for response. Getting relevant answers to these questions, despite multiple attempts, proved exceptionally challenging. Those connections are described hereafter.

[California’s Resource Conservation Districts](#) (RCDs) play a critical role in promoting and implementing forestry projects on non-industrial private forest lands throughout the state. Approximately 40 of the 96 RCDs in California have forestry programs, in collaboration with a variety of partner organizations. A few of these RCDs have their own small native plant nurseries. Thirty-four RCDs were contacted by the RSP, via letter, to inform them of our plans for propagating hardwood seedlings and our proposed pricing structure. RSP asked for feedback, whether positive or negative, as it is desired to compliment the ongoing restoration/reforestation efforts, not to compete with any partners within this effort. They were also encouraged to contact us via telephone, should they like to discuss this further. The California Association of Resource Conservation Districts (CARCD) was also contacted, as their role is to connect, serve and support the statewide network of RCDs. Although little feedback was provided by the RCDs to the RSP, all the comments received were supportive and positive. The consensus was that the more native plants that can be grown, the better. No concern was expressed about our proposed prices.

[Mark Martinez](#), Deputy Forester at The Los Angeles County Fire Department nursery program, was also contacted for input, as well as [Mariposa Native Plants](#), a small private start-up nursery serving the Sierra foothills. The former operation does not actually charge for their stock giving those away to local landowners in need. The latter operation sells stock no smaller than 1-gallon sizing and are not, therefore, seen as competition.

The attached “Private Nursery Price Survey” sheet details actual costs assessed by those businesses considered comparable to ours in species or stock size. Of the approx. 70 private nurseries surveyed, only 11 are producing one-year-old seedlings of similar species and in similar containers as LAMRC. The remaining nurseries are growing older plants only, in 1-gallon pots or larger. It was determined that, from respondents representing similar species and stock size options as RSP, their prices were set from the basis of selling specimens individually and, thus, are not truly comparable to our larger bulk plant sales schema.

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Private nurseries generally resemble “retail” stores, selling individual plants, as their customers are generally “landscaping” on a small piece of property. They generally produce seedlings of forest species in very limited quantities, reflecting a smaller economy of scale and necessitating a higher cost to their customers. Conversely, LAMRC resembles a “wholesale” outlet. LAMRC customers are restoring native plant “communities”, purchasing large numbers of plants at a time.

Sections 4681 and 4683 of the Public Resources Code discuss conservation standards and acceptable uses of seedlings purchased from LAMRC. In the context of providing seedlings for a conservation “project”, minimum quantities of seedlings for purchase must be established so as to not enter the market of landscaping nurseries. When a customer’s request for seedlings does not meet this minimum quantity for sale, RSP refers them to private landscaping type nurseries.

While many attempts were made to assess the cost comparison for other wholesale operations similar to LAMRC, RSP staff would attest that some were either unresponsive or may not be fully known to us. The attached pricing analysis includes all native hardwood seedling amounts made available to us organized by comparable stock size. Should other prices be made aware to RSP that would present a sense of competition, or if arguments are made by nurseries elsewhere in the state, RSP is fully supportive of reassessing fees as part of the program’s dedicated support to private industry.

Recommendations

After comparing the two methods of price analysis within the goals of having appropriate fees to cover operational costs while ensuring such revisions are not seen as competition with private industry, RSP suggests the following revised analysis for adoption by the BOF which also acknowledges a minimum order quantity.

a) Quantity

RSP suggests the following minimum contract order quantities for hardwood seedling sales within two distinct size classes:

- Large size class (40 or 60 cubic-inch containers): 20 seedlings, any species combination
- Small size class (10 or 16 cubic-inch containers): 30 seedlings, any species combination

**Large size class seedlings could be substituted for small size class specimens for purposes of meeting the minimum order numbers but not conversely.*

In proposing these amounts, RSP will separate the program from most retailers in the state that typically sell specimens individually or in minute quantities while also not burdening landowners who may not have large acreages but still want to stock them accordingly. Keeping two distinct size classes will allow for flexibility for diverse species orders while utilizing a relative size ratio to affect order amounts.

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b) Cost

Inflating previously approved prices to today's dollars (method of price analysis #1 above) is the more appropriate method to use in determining new prices for hardwood seedlings. LAMRC has a larger economy of scale, a different customer base, and a different mission than most private nurseries. If required to charge similarly high prices as private nurseries do for landscaping material, our plants would simply not sell.

The attached table summarizes the RSP's analysis results. It is proposed to adopt the prices determined by method of analysis #1 (inflation) within the minimum order numbers suggested above.

RSP appreciates the Board's consideration of this revised structure and hope that it may support the program's mission which serves all California forestlands by providing resources to protect and restore disturbed and degraded forests, maximizing their values, enhancing ecosystem functions, and increasing resiliency from climatic impacts. If approved, RSP would plan to make prices effective immediately. RSP staff welcome any questions or thoughts you may have.

Sincerely,

DocuSigned by:

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Stewart McMorrow
Staff Chief – Wildfire Resilience Program
CAL FIRE

Hardwood Nurseries Price Survey (2024)

Container Types and Volume (cubic inches)					
Nursery	Container Name	TB5	4-inch	D40	TB10
	Other Names	Treeband	Square pot	Deepot	AB410, TP1
	Volume	19 ci	28-44 ci	40 ci	143 ci (approx. 1 gal.)
	Species	(1-yr-old stock)	(1-yr-old stock)	(1-yr-old stock)	(2-yr-old stock)
Annie's Annuals and Perenials	Redbud		14.95		
	Strawberry tree		13.95		
	Toyon		13.95		
Artemisia Nursery	Calif. bay			10.00	14.95
	Coast live oak			8.95	
Bay Natives	Coast live oak				14.00
	Valley oak				14.00
California Flora Nursery	Buckeye				13.50
	Redbud				16.00
East Bay Wilds	Madrone				15.00
	Blue oak				18.00
	Coast live oak				18.00
	Oregon white oak				14.00
	Black oak				12.00
Elderberry Farms (Sac Valley CNPS)	Valley oak				12.00
	Black oak			13.00	
	Valley oak			13.00	
Linda Vista Native Plants	Interior live oak			13.00	
	Bigleaf maple			16.00	
	Buckeye			16.00	
	Dogwood				16.00
	Hollyleaf cherry			18.00	
	Coast live oak			16.00	
Neel's Nursery	Oaks			16.00	
	Buckeye			12.00	
	Redbud		7.00		
	Toyon	5.00			
	Coffebery		6.00		
	Hollyleaf cherry	6.00			
Oaktown Nursery	Coast live oak	3.00			
	Coast live oak			8.95	18.00
	Blue oak				18.00
	Black oak			9.50	18.00
	Valley oak			9.50	18.00
Theodore Payne Foundation	Buckeye (treeband)	8.00			
	Redbud		6.00		
	Coffebery		6.00		
	Sycamore (treeband)	6.00			
	Hollyleaf cherry		6.00		
	Canyon live oak (TB)	6.00			
Watershed Nursery	Coast live oak (TB)	7.00	6.00		
	Oaks			9.90	
	Oregon ash			9.90	
	Bigleaf maple			9.90	
	Dogwood			9.90	
Nursery Prices Shared	Redbud			9.90	
		7	9	19	16
Average Prices		5.86	8.87	12.07	15.59

Price Proposal Summary

Container size cubic inches	Seedling Age	Method 1 Analysis: Previous Prices Adjusted for Inflation Proposed New Prices	Method 2 Analysis: Upper 25% of Private Nursery Prices
10	1 year	\$1.50	--
16	1 year	\$2.40	--
19	1 year	--	\$6.93
28-44	1 year	--	\$11.91
40	1 year	\$3.00	\$15.04
60	1 year	\$4.00	--
143	2 years	--	\$16.80

Previous LAMRC Unit Pricing, Adjusted to 2024 Dollars

Inflation calculations per the U.S. Beureau of Labor Statistics, Consumer Price Index (CPI):

https://www.bls.gov/data/inflation_calculator.htm

Year	<i>13 cu in containers</i>		<i>40 cu in containers</i>	
	Previous Unit Price	2024 \$ Value	Previous Unit Price	2024 \$ Value
1999	1.40	2.63	2.45	4.60
1998	1.12	2.14	2.45	4.67
1997	0.96	1.86	1.18	2.29
1996	0.96	1.92	1.18	2.36
1995	0.88	1.81	1.12	2.30
1993	0.60	1.30	0.92	1.99
1992	--	--	0.82	1.82
1991	--	--	0.82	1.87
1990	--	--	1.53	3.71
1989	--	--	1.53	3.90
Averages	0.99	1.94	1.40	2.95

Hardwood Price Comparisons per Container Type and Volume (2024)

Typical Container Sizes <small>(images via Oaktown Nursery)</small>	LAMRC Container Sizes	Seedling Age	Private Nursery Low Price Range	Private Nursery High Price Range	Average Prices, Private Nurseries	Method 2 Analysis: Upper 25% of Private Nurseries Prices	Method 1 Analysis: Previous LAMRC Prices	Method 1 Analysis: Adjusted Prices Rounded Proposed New Prices
--	10	1 year	--		--		1.49	1.50
--	16	1 year	--		--		2.39	2.40
19	--	1 year	3.00	8.00	5.86	6.93	--	--
28-44 (ave. 36 cu in)	--	1 year	6.00	14.95	8.87	11.91	--	--
40	40	1 year	8.95	18.00	12.07	15.04	2.95	3.00
--	60	1 year	--		--	--	3.93	4.00
143	--	2 years	12.00	18.00	15.59	16.80	--	--

Hardwood Seedling Price Analysis (2024)

Previous Pricing Adjusted to 2024 Dollars

Inflation calculations per the U.S. Beureau of Labor Statistics, Consumer Price Index (CPI):

10 cu. in.	13 cu. in. (50 seedlings minimum order)	16 cu. in.	40 cu. in. (49 seedlings minimum order)	60 cu. in.
new size - round tube	previous container type - square tube	new size - round tube	previous container type - round tube	new size - square tube for buckeye only

Year	2024	13 cu in	Adjusted	2024	2024	40 cu in	Adjusted	2024	2024
	\$/Unit	\$/50	\$/50	\$/Unit	\$/Unit	\$/49	\$/49	\$/Unit	\$/Unit
1999	na	70	131.40	2.63	na	120	225.26	4.60	na
1998	na	56	106.88	2.14	na	120	229.02	4.67	na
1997	na	48	93.05	1.86	na	58	112.43	2.29	na
1996	na	48	95.88	1.92	na	58	115.86	2.36	na
1995	na	44	90.29	1.81	na	55	112.86	2.30	na
1994	na	na	na	na	na	na	na	na	na
1993	na	30	64.88	1.30	na	45	97.33	1.99	na
1992	na	na	na	na	na	40	89.33	1.82	na
1991	na	na	na	na	na	40	91.65	1.87	na
1990	na	na	na	na	na	75	181.56	3.71	na
1989	na	na	na	na	na	75	191.01	3.90	na
Averages: previously-used 13 and 40 cu in containers	na	49.33	97.06	1.94	na	68.60	144.63	2.95	na
Calculated 2024 Prices	1.49	na	na	na	2.39	na	na	2.95	3.93
Proposed (rounded) 2024 Prices	1.50	na	na	na	2.40	na	na	3.00	4.00

10-cubic-inch price = (13 cubic-inch price) x 10/13
i.e., proportioned down from previously approved 13 cubic-inch price

16-cubic-inch price = (13-cubic-inch price) X 16/13
i.e., proportioned up from previously approved 13-cubic-inch price

40-cubic-inch price = previously approved price inflated to 2024 dollars
The same container is in use today.

60-cubic-inch price = 40 cubic-inch price x 1.333
Price is inflated 1/3 above 40-cubic-inch price instead of 1/2 more, based not on added soil volume exclusively given the 40's and 60's have the same cross-sectional area, taking up equal space in the nursery