

Sacramento Valley Prune News

Spring & Early Summer, 2024

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Spring & Early Summer Orchard Considerations

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April

- ✓ **Crop assessment** – In late April or early May, pit tips begin to harden. This is around the time to estimate crop load and make thinning decisions. Bloom was inconsistent this year, with some growers seeing light to medium crop potential, and others seeing a heavy crop potential. After the heavy 2023 crop, it isn't unexpected that crop load might be lower this year. Careful estimation of crop load using the protocol outlined in [this article](#) will help you decide if and how much to thin.
- ✓ **Irrigation** – The growing season is starting out with a good amount of water in the soil profile after a relatively wet winter. Early season irrigation decisions can be based on ET reports, soil moisture, or stem water potential measured with a pressure chamber. Low to mild stress levels -2 to -4 bars below baseline are a good threshold to begin irrigation for prunes.
- ✓ **Fertilization program starts:**
 - Following your crop load assessment, develop the Nitrogen (N) budget for the 2024 season and begin applications in April. A dry ton of prunes contains roughly 12-13 lbs. of N that will leave the orchard in the fruit bins at harvest. Roughly 30 lbs. N/acre should be allotted for the tree (shoot growth, spur growth, etc.) and 70% efficiency (0.7 lb. N into the tree for every pound of fertilizer N applied to the soil) can be assumed with multiple (2-3) applications before harvest. The annual N budget/acre for a mature prune orchard with a good to heavy crop should be 100-115 lbs. N/acre. For best efficiency, make several smaller (for example, 25-40 lbs. N/acre) N applications through the season and inject liquid fertilizer late in the irrigation set and then flush with at least 1-2 hours of clean water.
 - If using foliar potassium nitrate sprays as your potassium (K) program or to supplement soil applied K, begin spraying in late April and make additional applications every 2-3 weeks. More details at sacvalleyorchards.com/prunes/horticulture-prunes/prune-orchard-nutrition-thoughts-for-2017.
- ✓ **Aphid:** Monitor for leaf curl plum aphid and mealy plum aphid since colonies can grow quickly as orchards leaf out. Oil sprays any time from petal fall to May 15 can reduce mealy plum aphid to acceptable levels with good to excellent coverage; however, growers should note that oil will also negatively affect parasitoid wasps in the field. Oil is not effective against leaf curl aphid during this period as the spray can't reach inside the curled leaves where the aphids are feeding. Other pesticides are effective in controlling aphids during the spring but be careful to avoid flaring mites with pyrethroids (Asana®, Warrior®, etc.) or neonics (Actara®, Provado®, etc.). BeLeaf® can also provide excellent aphid control when monitoring shows a need. More information

on monitoring and management of aphid populations at: sacvalleyorchards.com/prunes/aphids-spring-summer-management/.

- ✓ **Peach twig borer (PTB) and Oblique-banded leaf roller (OBLR):** These worms feed on the fruit surface later in the season, damaging the fruit skin and “opening the door” for fruit brown rot infection later in the season. Don’t assume earlier sprays worked to control these populations. Place and monitor pheromone traps to establish biofix dates for these pests. Begin accumulating degree days after the biofixes to inform when to begin fruit inspection. PTB biofix in prune can differ substantially from almond, so don’t rely on information from other fields.
- ✓ **San Jose Scale (SJS):** If a biofix was not established using pheromone traps in February, apply double-sided sticky tape around limbs in early April to detect SJS crawler emergence. Monitor for increased SJS populations if neonics are applied for aphid management. Find more details on SJS at ipm.ucanr.edu/PMG/r606302111.html.

May

- ✓ **Irrigation:** Continue monitoring pressure chamber, soil moisture and/or weekly ET to manage irrigation and maintain adequate orchard moisture. May and June are the most critical months for end-cracking. Also, watch the weather forecast for sudden jumps in temperature that can occur in late May or early June as the weather switches mode from spring to summer. Sudden 15-20 degree increases in temperature can result in fruit sunburn damage; making sure orchards are not behind on irrigation when the heat hits may reduce damage.
- ✓ **Rust:** Start monitoring in early May, surveying 40 trees weekly until July 15. Check lower parts of the canopy for leaf symptoms (spots) and pay close attention to non-bearing replants, exceptionally vigorous trees, and previous hot spots. Consider treating when the first leaf with rust is found. For more on rust see: ipm.ucanr.edu/PMG/r606100611.html.
- ✓ **Peach twig borer (PTB) and Oblique-banded leaf roller (OBLR):** Inspect fruit 400-degree days after the first PTB biofix. Look for larval entry points on the fruit (ideally 15 fruit from 80 trees), especially at fruit-to-fruit or fruit-to-leaf contact points. Treat if 2% or more (24+ of 1,200) of the fruit have damage. For OBLR, begin fruit inspections at 930-degree days after biofix for that pest, following the same sampling protocol and treatment threshold. More on PTB at: ipm.ucanr.edu/PMG/r606300211.html and on OBLR at: ipm.ucanr.edu/PMG/r611300511.html.
- ✓ **Aphids:** Leaf curl plum aphids move to summer hosts in May, but mealy plum aphid stay in orchards until mid-July. Heavy infestation of mealy plum aphid can limit flower bud development this year, which can mean less crop next year.
- ✓ **Fertility:** Continue with nitrogen and potassium fertilization program if a good crop is set. More than 50% of annual N budget should be applied before June 1st.

June

- ✓ **Pest and disease management:** Continue monitoring for aphids and rust.
- ✓ **Spider mites:** Begin scouting by checking two different sections of the orchard each week. Spend about five minutes in each section, checking 2-3 leaves (some inside and outside of the canopy) on 10 trees. Look for spider mites as well as predators (predaceous mites and sixspotted [thrips](#)). Treatment decisions should be based on population levels of both mites and predators. If more than 20% of leaves have mites, but less than 50% of the leaves have predators, treat for mites. If more than 60% of leaves have mites, treat even if most leaves have predators. For more, see: ipm.ucanr.edu/PMG/r606400411.html.

- ✓ **Irrigation:** Mild to moderate tree water stress (-4 to -110 bars below baseline, measured by a pressure chamber) can help avoid excessive vegetative growth and associated pruning costs next winter without slowing fruit sizing this season. Maintain this water stress until fruit has reached physiological maturity (when fruit averages 4lbs internal pressure), typically in early to late August.

Learn more at <https://www.sacvalleyorchards.com/manuals/stem-water-potential/advanced-swp-interpretation-in-prune/>.

Note: In late June, consider the weather forecasts when deciding on irrigation through early July. Traditionally, many growers reduce irrigation going into the July 4 holiday in an effort to reduce orchard humidity and chances of fruit side cracking caused by dew events if the weather suddenly cools. Reduced irrigation to reduce side cracking may increase the risk of fruit sunburn if the weather stays hot. The weather is hard to get right but adding sunburn risk to the conversation along with side cracking risk is suggested. Side cracking is more of an economic risk in years with light crop and larger fruit while sunburn may be a higher economic risk in heavier crop years with less extra-large fruit. See more information on sunburn (“blue prune”) at [sacvalleyorchards.com/prunes/blue-prune-drop/](https://www.sacvalleyorchards.com/prunes/blue-prune-drop/).



The Big Three in Prunes

Curt Pierce, UCCE Glenn, Tehama, Colusa, and Shasta Counties

Franz Niederholzer, UCCE Colusa and Sutter/Yuba

Jaime Ott, UCCE Tehama, Shasta, Glenn, and Butte Counties

With good prices and good bloom weather, prunes are looking to have another profitable year. To make the most of that, set yourself up for success by producing a large crop of large fruit. By far the three most important management decisions dictating fruit size and crop size (and therefore grower returns) are 1) cropload management, 2) irrigation, and 3) nutrient management (especially potassium). Give these “Big Three” the attention they deserve to make the most of this year’s crop.

- 1) Manage cropload appropriately.** This looks to be another year where reference date fruit thinning will be an important tool for producing an economically viable crop. Despite our large crop last year, many orchards had a good return bloom and good percent set. Thinning fruit on or just after reference date has been shown to increase profits by increasing the number and tonnage of A and B screen fruit. See [this article](#) for information on assessing cropload and determining a need for thinning. Even if you think your crop is light, it is worth stripping a tree or two to verify cropload.

During thinning, the most crucial decision is how much fruit to leave on the tree. Be realistic about the tonnage per acre and the number of fruit each tree can size: if the trees carried 6T/acre in the past few years but you had too many undersized fruit, it is unlikely that the trees will be able to adequately size a 6T/ac crop this year. 3-4T/ac of good-sized fruit will likely pay better and will lead to less stress on your trees.

2) Manage irrigation for fruit size. When considering early season irrigation in prune, the best approach is to monitor tree water status to determine the timing of irrigations whenever possible. Too much soil moisture early in the growing season can result in leaf yellowing from iron chlorosis. An excellent start to the 2024 water year and rainfall persisting into late spring may equate to soil moisture contents being higher in the effective root zone than expected. While well-placed soil moisture sensors provide useful information, only pressure chamber readings of the tree water status will let you know when the trees are ready for additional irrigation.

Your goal with irrigation should be to balance soil moisture, keeping it neither too wet nor too dry. Partially wet soils in the root zone allow for maximum growth of the new roots, which can best uptake water and nutrients from the soil. Saturated soils inhibit root development, leading to root rot. It is also critical to not allow orchards to dry out fully, as drought stress reduces final fruit size. Read [this article](#) for more information on drought stress effects on fruit size. Rewetting soils that have previously thoroughly dried out can lead to end cracking on fruit later in the season. Balance in soil moisture is of the utmost importance, and managing tree water status with a pressure chamber, combined with the use of soil moisture sensors to help inform your irrigation plan, is the key to healthy, productive trees.

3) Maintaining prune orchard nutrition is critical to producing a large, high-quality crop and maintaining good orchard health. The key nutrients in prune orchards up and down the Sacramento Valley are nitrogen (N), potassium (K), and zinc (Zn). Other nutrients may be important in individual orchard sites, but these are the three to focus on.

Potassium is particularly important to fruit production and prune orchard health. Deficiency of this nutrient can result in series of terrible events for a prune orchard-- leaf loss, sunburn of now exposed wood bark, Cytospora infection of sunburned bark, and tree death as the Cytospora spreads and girdles the scaffold or trunk. Cytospora can stay active in the tree over a number of years (unless a very good pruning crew can see and cut it all out). Don't sleep on potassium nutrition, especially in a heavy crop year following a heavy crop year.

These are tough times for tree crop growers in the Sacramento Valley. Trimming nutrient costs, where necessary, not eliminating them is recommended. Instead of "saving" by eliminating or sharply reducing fertilizer application, the recommendation is to focus on efficient application practices to trimming costs while maintaining orchard health and productivity. Examples of these practices include multiple small N and/or K fertigation "shots" timed to match tree nutrient needs or a foliar zinc spray in the spring or fall with a proven fertilizer such as zinc sulfate or basic zinc sulfate (neutral zinc).

Find Small Improvements: The 5% Rule

After years of removing acreage to adjust to a changing market, California prune growers are now receiving a higher price. Data from USDA-NASS shows that prune price received has been trending upwards for the past few years (Figure 1). However, rising production costs continue to squeeze profit margins.

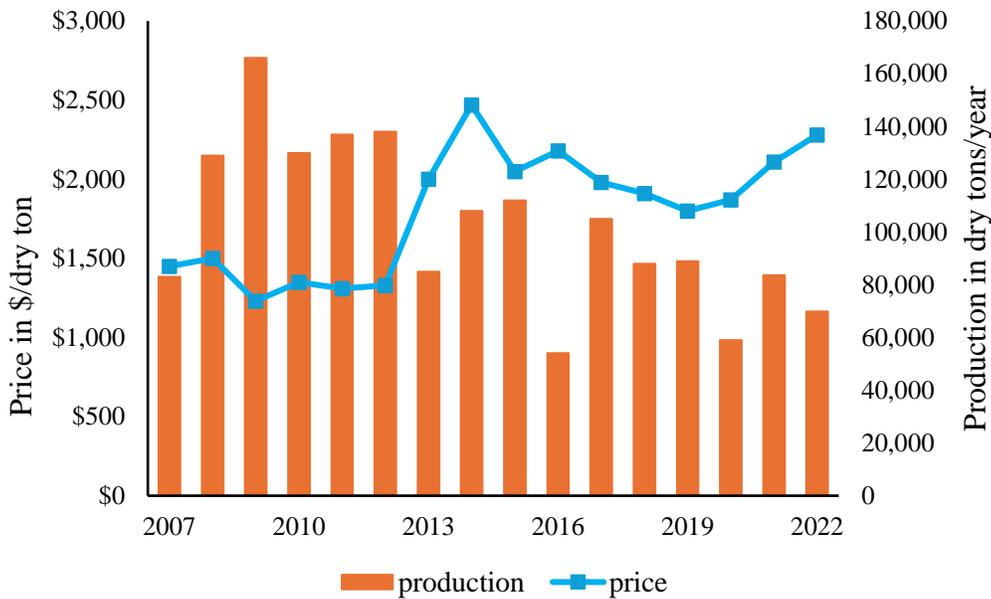


Figure 1. California prune production (dry tons/year) and price received (\$/dry ton) from 2007 to 2022. Data source: Survey data from [USDA-NASS](#)

The five percent rule can be an effective principle for improving profits. The rule advocates for small improvements across multiple aspects of an operation rather than

striving for large gains in one or two areas. Coined by [Danny Klinefelter](#), the rule suggests that a 5% increase in price received, a 5% decrease in costs, and a 5% increase in yield will often produce more than 100% increase in net returns. This outcome is possible because the effect of these small improvements is cumulative, multiplicative, and compounding, and not a simple 15% (5%+5%+5%) increase.

Below is a simple per-acre illustration of how small improvements in yield, price, and cost together can lead to big gains in profits.

	Before	% change	After
Yield (tons/acre)	3.50	(+) 5%	3.68
Price	\$2,000	(+) 5%	\$2,100
Revenue	\$7,000		\$7,718
Cost	\$6,000	(-) 5%	\$5,700
Profit	\$1,000		\$2,018

Together, these 5% improvements increase profit from \$1,000/acre to \$2,018/acre— a 102% increase in profit. Many individual producers are price ‘takers,’ so they do not have control over the price they receive for their product, even when their cost of production increases. In this illustration, if cost can be cut by 5%, yield increased by 5%, and price remains the same, then profit will increase by 65%.

The whole idea is to focus on achieving small, incremental changes across multiple areas of your operation and not chase drastic improvements in only some aspects, which can be expensive, risky, frustrating, or lead to missed opportunities.

Start by conducting a thorough evaluation of your operations to identify opportunities for small improvements. It is dangerous to get stuck in the mindset of "We've always done it this way," as Kristjan Hebert emphasizes in his presentation ['5% Rule-Baby Steps to Bigger Profits.'](#) Actively seek out [recommended practices](#) that could

potentially boost your production efficiency and yield. For example, timely [thinning](#) and [harvesting](#) are key to large, high-value fruit production, while also reducing harvesting and drying costs. Optimize your fertilizer usage by applying small doses throughout the season rather than in large slugs at one time. Decrease weed management costs by reducing the frequency of spraying or mowing, rather than cutting weed management all together. Generally, growers should continuously assess all aspects of their operation, seeking opportunities for cost reduction, yield improvement, and potentially commanding a higher price.

Consistency is key to adhering to the 5% rule. It is an ongoing process and cannot be achieved overnight. It requires consistently striving for small improvements year after year, to experience the big cumulative effect.

New UC Davis Prune Varieties Prove Promising

By Sarah Castro & Dr. Ted DeJong

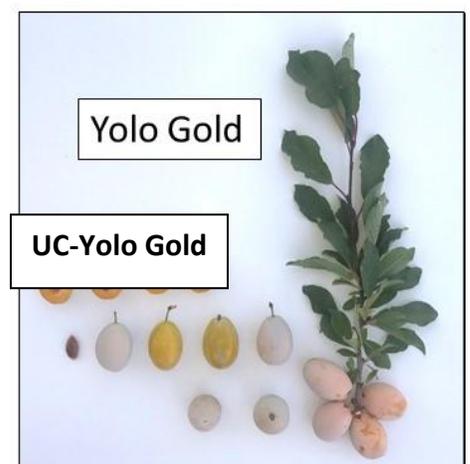
The UC Davis Prune breeding program patented a new variety in 2023, and we are promoting new promising French-type selections. The new variety, 'UC-Yolo Gold'[™], offers superior flavor and a late harvest date. The French types have a variety of harvest and bloom dates, and all have low dry-away ratios that are sure to draw attention from prune growers interested in lowering their operational costs. Many of the cultivars have been test-processed and dried using commercial dehydrators in cooperation with interested growers.

The breeding program aims to breed new cultivars that will save growers on operational costs and stabilize prune production in California. This program is directed toward reducing drying costs with lower fruit dry-away ratios and lowering production costs by reducing pruning. The program has many new items every year that are commercially viable candidates for future release. Many of the new selections are well suited for high-density situations because these new tree types produce fruit within three years of planting. In high-density plantings, the orchard trees are not trained to establish scaffolds but rather to settle down and produce fruit as early as possible. These new varieties can produce fruit in the second leaf, thus making them perfect candidates for high-density orchards.

UC-Yolo Gold[™]:

Pro: Tastes superior Con: Does not mix with Improved French

UC-Yolo Gold[™] is a prune tree with yellow fruit that can begin to dry on the tree before there is substantial fruit drop. The tree blooms approximately four days before 'Improved French' and is ready for harvest approximately ten days after 'Improved French.' The fresh fruit is oval-shaped and maintains its shape when dried. Fresh fruit weight is larger than 'Improved French,' and dried fruit ranges from 9.8 to 11.9 g. Dry-away ratios range from 2.5 to 3.1 depending on sugar content and fruit maturity. Fruit sugar contents range from 22 to 27 °Brix, and fruit sugar content appears more affected by over-cropping than fruit size. The flowers are pollen self-compatible. The tree grows relatively



upright and bears primarily on spurs and short shoots. The tree is more precocious than 'Improved French,' meaning it will produce fruit earlier in its life. This tree has been selected primarily for its consistent bearing and dried fruit quality and flavor. It was successfully dried and pitted by Mariani in 2020, Sunsweet in 2021, and Taylor Brothers in 2022. It was patented under the name 'UC G2S-8' but trademarked as 'UC-Yolo Gold™.'

In addition to our new release, we have obtained encouraging results from four new advanced selections that mature after 'Improved French.' Like 'Improved French,' these selections are pollen self-fertile. All these selections develop fruit with very high sugar content, have low dry-away ratios, and taste great (see Table 1). They offer differing harvest dates but produce dried fruit that can be easily mixed with Improved French.

J2N-128 This prune tree produces purple fruit that harvests a week or two after 'Improved French.' The fruit has a fresh to dry weight ratio of 2.2 to 2.4 with a sweet, satisfying prune flavor. The fruit does not typically get softer than 4lbs pressure because the fruit will start drying on the tree rather than softening and falling off. This leafy tree is upright in structure and is more spur-bearing than 'Improved French.' It also blooms about a week before 'Improved French.' While it has never been test-pitted, it will likely have no problems being dried and pitted, and the tree is precocious, meaning it will produce fruit early in life, usually after its first leaf. Six acres of test trees are anticipated to be planted in the next year.

J2N-127 This prune tree produces purple fruit that can begin to dry on the tree before any substantial drop. It harvests with or after 'Improved French' but blooms about ten days before 'Improved French.' The fresh fruit size is about 15.8 to 28.2g, and the dried fruit weight ranges from 7.3 to 9.5g. Fruit sugar contents range from 27.1 to 37.4 °Brix. The dry-away ratio ranges from 1.9 to 2.9. To obtain the lowest possible dry-away ratio, the fruit must hang on the tree and start to shrivel. This item combines the convenience of a low dry-away ratio with good dried fruit quality. The trees are very precocious; they can produce fruit on first-leaf trees. The trees are fairly upright, spur-bearing, and consistently set a crop. If over-cropped, the fruit size decreases, but no alternate bearing has been detected in subsequent years after good crops. A one-acre test planting with bare root trees is being planted near Yuba City in 2022.

J2N-79 This prune tree produces dense, purple fruit that harvests around or after 'Improved French.' The dry-away ratio ranges from 2.0 to 2.9 depending on how long the fruit hangs on the tree before harvest. The fruit does not soften like 'Improved French'; sugars increase because the fruit partially dries on the tree, and the flesh does not soften. The dried fruit is dense and tough in its natural condition before pitting, but the processed fruit is very pleasant to eat, with soft flesh and texture. The fruit size varies depending on crop load. This tree should not be over-cropped. The flowers typically bloom six days before 'Improved French,' and the pollen is likely self-compatible, but this is being confirmed in 2022. The tree structure is upright, with a tendency to be spur-bearing. This variety is planted in a high-density situation and is doing well. Eight acres of test trees are planned to be planted in Fall '23/Winter '24, some in the Winters area and others in the Fresno area.

I12S-6 This purple prune has shown promise with an exceptionally long harvest window extending from a week before 'Improved French' to nearly one month later with minor changes in flesh pressures but increasing fruit soluble solids. The fresh and dried fruit is oval in shape, and the fresh fruit ranges between 24.1 to 32.9 g, while

the dried fruit ranges from 9.0 to 10.4 g. Fruit sugar contents range from 27.5 to 35.8 °Brix. Dry-away ratios can range from 2.3 to 2.8. Flowers bloom about 11 days before 'Improved French' and are pollen self-compatible. This tree is very precocious and will produce flowers on first-leaf trees. The dried fruit is pleasant to eat with a semi-free pit and good prune flavor. Test pitting will be completed in 2023 to determine suitability for commercial processing.

J2N-182 is the newest addition to the top item list. It harvests after and blooms 11 days before 'Improved French.' J2N-182 has excellent eating quality and arguably has the best dried fruit taste. If overcropped, the fruit will be small **with a higher** dry-away ratio, so thinning is essential in heavy crop years. This tree produces fruit early in life and has proven to self-pollinate. We have more to learn about this item, but it has proved very promising so far. There are plans to plant 2 acres of test trees in the coming year.

Table 1. The newest promising items available for testing from the UC Davis Prune Breeding program. Many items start to dry on the tree before harvest, and all have had at least four years of promising fresh and dried evaluations.

Harvest date, Winters, CA	Item Name	Fresh Weight (g/frt)	Pressure	Brix	Count/ lb	Dry away ratio	Average Bloom Days before Imp. French	Fruit Type
9/6/2023	I12S-6	24.7	5.7	30.7	44.4	2.4	-11	French
9/12/2023	J2N-127	24.1	6.1	30.6	47.7	2.4	-11	French
9/19/2023	J2N- 79	40.0	6.4	30.4	28.3	2.6	-8	French
9/13/2023	UC-Yolo Gold	32.8	3.4	27.1	44.5	2.8	-5	Gold Gourmet
9/13/2023	J2N-128	23.8	4.1	34	44.5	2.3	-7.5	French
9/19/2023	J2N-182	30.4	6.2	30.2	61.2	2.8	-11	French
9/6/2023	IMP FRENCH	20.7	2.9	35.4	52.5	2.6		French

The prune breeding program is funded by the Prune Board of California. The breeding program aims to breed new cultivars that will save growers on operational costs and stabilize prune production in California. The main costs the program tries to reduce are drying costs (via dry away ratio) and pruning costs. The program has many new items every year that are commercially viable candidates for future release. We try hard to test these items as much as possible, but help is needed from the industry to evaluate them thoroughly. For example, rootstock compatibility is still being determined, specifically with Krymsk 86. Extra tests around California help bolster our confidence that these items will reduce grower costs and revitalize the California

prune industry. If you are interested in planting some new cultivars, please contact Sarah (scastro@ucdavis.edu). The Prune Board has a subsidy program that helps reduce your financial risk. Another way to learn about this program is to follow it on Instagram at @cali.prunebreeder.

For more information about these items, please contact Sarah Castro.

Email: scastro@ucdavis.edu

Instagram: @cali.prunebreeder



Save the Date for these Spring 2024 Meetings

Meeting	Date	Time	Location
<p><u>May Third Thursday Things from the Field</u>, Almond Variety and Rootstock Selection.</p> <p>A monthly event to talk with Sac Valley orchard advisors and other industry members in a casual setting and get timely updates on issues we’ve been seeing in the field. The first hour will feature lunch and a UCCE talk with Q&A on an orchard topic relevant to the time of year. After the talk, bring observations, questions, and pictures about your orchards for UCCE advisors and the group to discuss.</p>	5/16/2024	Lunch 11:30 a.m. -1:30 p.m.	UCCE Cooperative Extension, Glenn County, 821 E South St, Orland
<p><u>Prune Research Field Tour</u></p> <p>Join us for a 1.5 day field tour of research trials and grower orchards throughout the Sacramento Valley. The agenda is still in the works, but we expect to take a full day on the 29th and a half day on the 30th. We encourage you to take this opportunity to see our research trials first-hand and to interact with researchers, growers, and industry members.</p>	5/29/2024 + 5/30/2024	Morning on May 29- Lunch on May 30	Sacramento Valley
<p><u>June Third Thursday Things from the Field</u>, topic TBD.</p>	6/20/2024	11:30 a.m. -1:30 p.m.	142 Garden Hwy, Yuba City

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Prune Newsletter

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