NOVEMBER & DECEMBER 2022

VOL. 54, NO. 6 – $7.50

FRUIT GARDENER

California Rare Fruit Growers

Judging is done for the 2022

Fruit Shoot Winners

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Delicious Pawpaws

...the reward for many years of trial and error

Don says he anticipates ripe pawpaws more than cherimoyas or atemoyas

- A Look at Sour Oranges
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- Protecting Citrus from Freezing

Insect pest advisory to members

Black Fig Flies – Flying Under the Radar

By Jenny Weaver

IMAGE COURTESY OF HOUSTON WILSON, PHD – ASST. COOPERATIVE EXTENSION SPECIALIST – UC RIVERSIDE DEPT. OF ENTOMOLOGY

Figs... you either love or hate them. I love them! They are little sacks of jam. You can eat them fresh off the tree, dry them, skewer them with meat kabobs, put them on pizza, or use them to make fig bars or fig ice cream. They are a great fruit to grow at home because they're difficult to find in stores and, if you do find them, they're expensive. One reason you almost never find them in stores is because for full flavor they need to ripen on the tree, which makes them difficult to ship. If you get lucky, when the figs are in season you just might find them at your local farmers market.

Until recently, those who like to grow figs in California have had relatively few insect and disease pests to deal with. One disease example that has been around for a while is the fig mosaic virus which can reduce your crop yield. Gophers are another perennial problem. Fig roots are one of their favorite meals. They can kill even a large tree. Planting trees in gopher cages can protect young. Otherwise, trap, trap, trap! Other pests include birds, raccoons, and opossums. However netting can help to prevent them from enjoying your ripe fruit.

But now there is another pest that doesn't just enjoy figs. This is a more insidious pest because it lives on figs exclusively: the Black Fig Fly (BFF). The larvae of this insect can destroy much of your fig crop ***before*** it gets ripe! So BFF *is a big deal!*

Figs are primarily a home crop for most readers of the *Fruit Gardener*, so it is crucial for us all to be keenly aware of this relatively new pest. *Remember: its only diet is figs*. Now that it has been found in eight counties in Southern California, it's definitely on the radar of the California Department of Food and Agriculture (CDFA).

Please be sure to read this article to the end. If you have black fig flies or suspect that you have these pests, ***do not*** compost any of the dropped green figs or put them in your greenwaste cans! Doing so will only promote their reproductive life cycle! Any infested figs ***must*** be disposed of properly.

I started all my fig trees years ago from cuttings that I obtained at the Central Coast Chapter's annual scion exchange. I have 13 trees in my small home yard. One exception is a tree that's over 30 years old. I think it's a Desert King and it produces a huge breba crop (the early crop on last year's wood). I have 9 fig trees espaliered between two trellises. Some of the scions I took home from scion exchanges were orphans or poorly labeled as "green fig". There are more than 700 named fig varieties. I wish I knew the names of all of my figs, but, as Shakespeare might have said, "A fig by any name would taste as sweet!"

One of the orphans turned out to be an Armenian fig which became one of my favorites (actually, whichever fig is ripe is my favorite). The Armenian fig is huge and has very thin, delicate skin. It also has a big eye, or ostiole, which makes it susceptible to infestation by large insects and molds. It is so large and delicate that it would be

very difficult for growers to ship. You just don't see them in stores, so home growers are really the main source of these big, tasty treats and, of course, many other tasty varieties. So home growers need to be on the lookout and wary of this new pest. In my opinion, because figs are not a big commercial fruit, they have not been getting the attention needed to eradicate this pest. But as mentioned, they are now on the radar of CDFA and they should be on yours as well.

BFF Discovery & Possible Regulation

Understandably, I was extremely upset when I learned about this new invasive pest from the Mediterranean region, the Black Fig Fly, or BFF. I usually add another F and say FBFF, the extra letter to represent a word I can't use here!

In July 2021, I saw a public service announcement on the main page of crfg.org: "Urgent PSA For All California Fig Growers." Of course being a fig grower, I read it right away. That was the first time I had heard about the black fig fly. I was so thankful to CRFG for providing that warning!

I recalled as I read it that several years prior to the announcement, a neighbor with many fig trees asked me why so many of her unripe figs were falling off. I "Googled" it, and the only possible causes I found were lack of water and wildlife. I too was seeing a few unripe figs on the ground, but I had always assumed that raccoons and opossums had knocked them down. Knowing what I know now, I think it was the beginning of the BFF invasion.

Because I have neighbors with fig trees and I know many CRFG members who grow figs, I contacted my local San Luis Obispo (SLO) County agriculture department as soon as I could to find out what they and the CDFA were doing about the problem. I was told that the county pest detection program was looking for the BFF that but no quarantine had been established.

Then on July 14, 2021, CDFA issued a pest detection advisory for the black fig fly to all county agriculture departments. Following are excerpts:

> "The only known host for this species is edible fig (*Ficus carica*). There are reportedly 4–6 generations per year. Since *Silba adipata* can cause major fruit drop, there could be a major economic impact to California's fig industry.
>
> "Damage occurs after the adult female lays eggs in the fruit, which hatch into larvae that tunnel through the flesh of the fruit making it unfit for consumption. Infested figs may change color and will often prematurely drop from the tree before ripening. Dropped figs may have larval emergence holes (approximately 1 mm in diameter) and larvae may be present inside the fruit. The presence of larvae in dropped fruit that is still in relatively good condition is an indication that the fruit drop is a result of an infestation and any larvae found should be submitted to the Plant Pest Diagnostics Center as potential black fig fly."

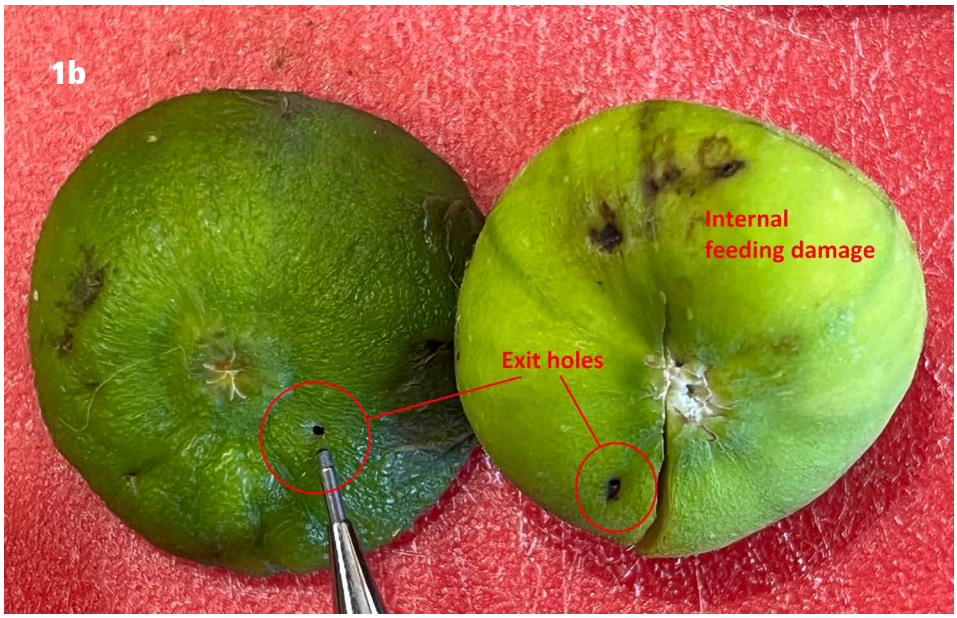
In case you should happen to see a suspect, remember that the adult is a small black fly with large red eyes. The fly depicted on the opposite page laying eggs in a fig ostiole is a great example of size and recognition details.

While the BFF has (so far) not been found in California's primary fig production counties of Merced and Madera, infestations elsewhere in California need more attention. Unfortunately, the BFF has not been getting the attention it needs. Certified producers who sell at farmers markets, and nursery owners as well, are suffering extensive losses caused by this pest. Most likely, backyard home growers are losing figs and may not be aware of the probable reason.

In August, 2021, I started paying closer attention and I noticed several unripe figs under my tree with exit holes and peel damage caused by internal feeding, shown in photos 1a and 1b. Cutting several open, I found damage and many white larvae. See photo 2, next page. I took them to my local county agriculture department. They sent them to the CDFA lab, who confirmed that they were the black fig fly! At this point the local agriculture department officially logged the BFF as being present in our area.

I kept a tally of the figs that had fallen from my largest fig tree, a Desert King. In April of 2022, I was picking up from 1 to 22 figs daily from the breba crop! It was heartbreaking. When I got to 137, I gave up counting!

The county pest detection program was also starting to find the BFF in McPhail traps (special glass jars with a yeasty *continues...*



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liquid which lures many types of flies to yeasty water, where they can't escape and eventually drown) in the cities of Cayucos, Los Osos and San Luis Obispo. The BFF appears to prefer the milder climate near the coast according to an agriculture department spokesman in this county.

On September 20, 2021, CDFA adopted section 3591.12, Black Fig Fly Eradication Area, of Title 3 of the California Code of Regulations. This regulation would give CDFA eradication authority to address the BFF incursion into California. It was for the entire counties of Los Angeles, Orange, Riverside, San Bernadino, Santa Barbara and Ventura. The regulation expired on March 3, 2022.

Thanks to a 6/6/22 Facebook post on my Central Coast Chapter's page by Kirsten Pearsons, a University of California Cooperative Extension (UCCE) small farm advisor, I learned that CDFA is proposing to reinstate Section 3591.12. The regulation was open for public comment through July 18, 2022. If you have questions about the regulation and/or want to provide comments, you can contact Dean Kelch (CDFA) by email at dean.kelch@cdfa.gov.

On June 28, San Luis Obispo County was added to the list. That pushed the closing date two weeks further out, allowing more time for comment.

My former colleague, Edwin Moscoso, San Luis Obispo County deputy agricultural commissioner-sealer who oversees the pest exclusion program, provided this explanation of an eradication area:

> "CDFA is required by law to investigate/evaluate the existence of pests not generally distributed within the state, determining the probability of their spread and the feasibility of their control or eradication. Based on the results, it is possible that CDFA concludes that there are no effective methods and means to eradicate the pest, taking no action."

If you are in a county not yet infested and believe you have found a BFF-infected fig, please put the fig in a sealed bag and call your nearest county agriculture department (agricultural commissioner's office) or the UCCE. You can find the closest office to you on this website: https://www.cdfa.ca.gov/exec/county/documents/countycommissionersealercontactinfo.pdf.

Here is more information about BFF, the proposed regulation and resources.

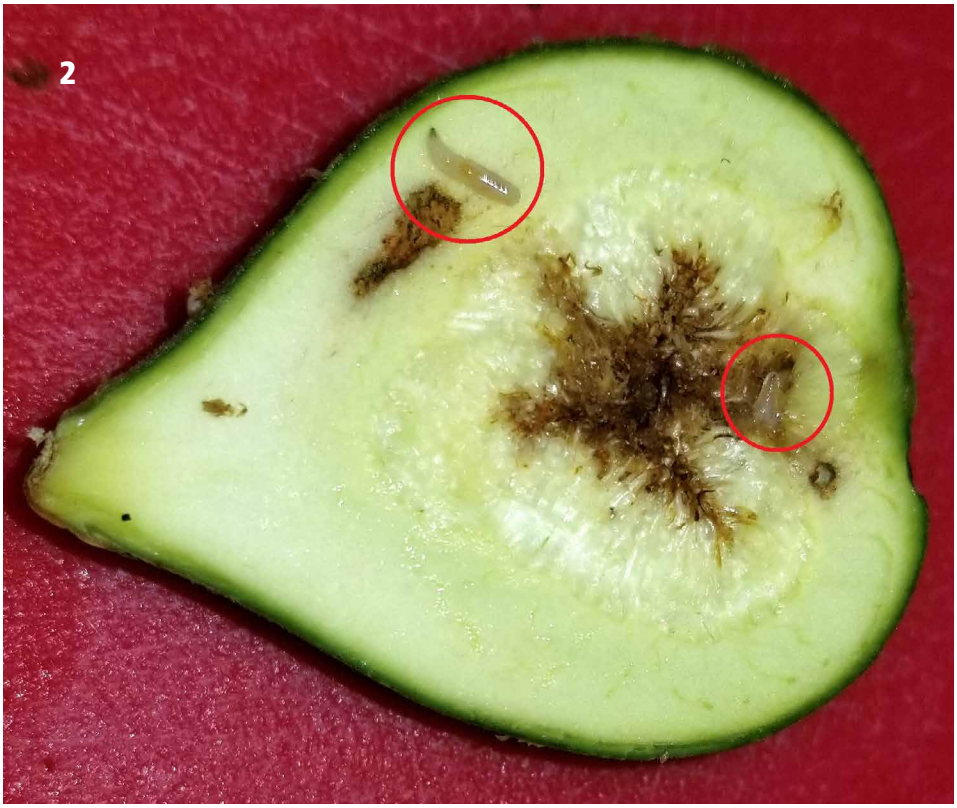
Pest Alert for BFF: https://www.cdfa.ca.gov/countyag/postings/files/Wilson_et_al_-_P.pdf.

The proposed regulation: https://www.cdfa.ca.gov/plant/docs/3591-29_bff_reg_text_20_sep_2021_final.pdf

Public Comment info: https://www.cdfa.ca.gov/plant/docs/3591.29_BFF_Notice_2022.pdf

You can report to CDFA's Pest Hotline: 1-800-491-1899 https://www.cdfa.ca.gov/plant/reportapest/

You can also reach out to your local UCCE Master Gardeners for advice: https://ucanr.edu/sites/mgslo/Master_Gardener_Helpline/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So what can you do right now to help slow the spread of BFF and protect some of your figs?

To find some ways to help control the damage to my figs, in April 2022 I spoke with Edwin Moscoso and Houston Wilson of the Cooperative Extension at UC Riverside who is doing research on the BFF. Houston recommended putting a fine mesh bag such as a small jewelry bag or a paint strainer mesh bag over undamaged, unripe figs. See photos 3, 4 & 6. I have tried both. I purchased 100 jewelry bags from Amazon for about $12 and two 5-gallon paint strainer bags from a local hardware store and put the bags around my "good" figs. Because you can see the black holes where the larvae emerge (photo 1), I inspected the figs still on the tree and bagged those that appeared undamaged. I prefer the individual small bags because the large bag envelops figs and foliage, restricting the leaves as photo 4 shows. Note that photo 6 shows the smaller bags covering only the ripe fruits.

One possible control method is using a McPhail trap. Plastic McPhail traps and Torula yeast tablets are commercially available from various sources. Using them is simple: add two tablets to fresh water, hang the trap in your fig tree and change the liquid monthly. I purchased mine online from Peaceful Valley Farm & Garden Supply, https://www.groworganic.com/.

I have been using one McPhail trap, shown in photo 5, and since May I have noticed a reduction in dropped figs in the main crop—as opposed to the earlier breba crop. I also hung some old-fashioned, sticky fly strips in my fig tree, shown in photo 6. Both traps caught lots of flies.

You can also make your own OLIPE trap (Olivarera los Pedroches) from a plastic bottle. It was developed in Spain (apparently in the olive groves of the Los Pedroches region) to control olive fruit fly. Here are directions and a diagram to make your own low-cost fruit fly traps: https://ucanr.edu/sites/SoCo/files/27233.pdf.

Maria Murietta of the UC Cooperative Extension office in San Luis Obispo recommends putting weed cloth under the fig tree to prevent the larvae from pupating in the soil. If that is not feasible, I recommend at least removing all plants below the fig tree so it's easier to find the fallen figs and remove them as quickly as possible.

I had some bagged green figs fall off and later a brown pupa developed inside the bag! The larva was still

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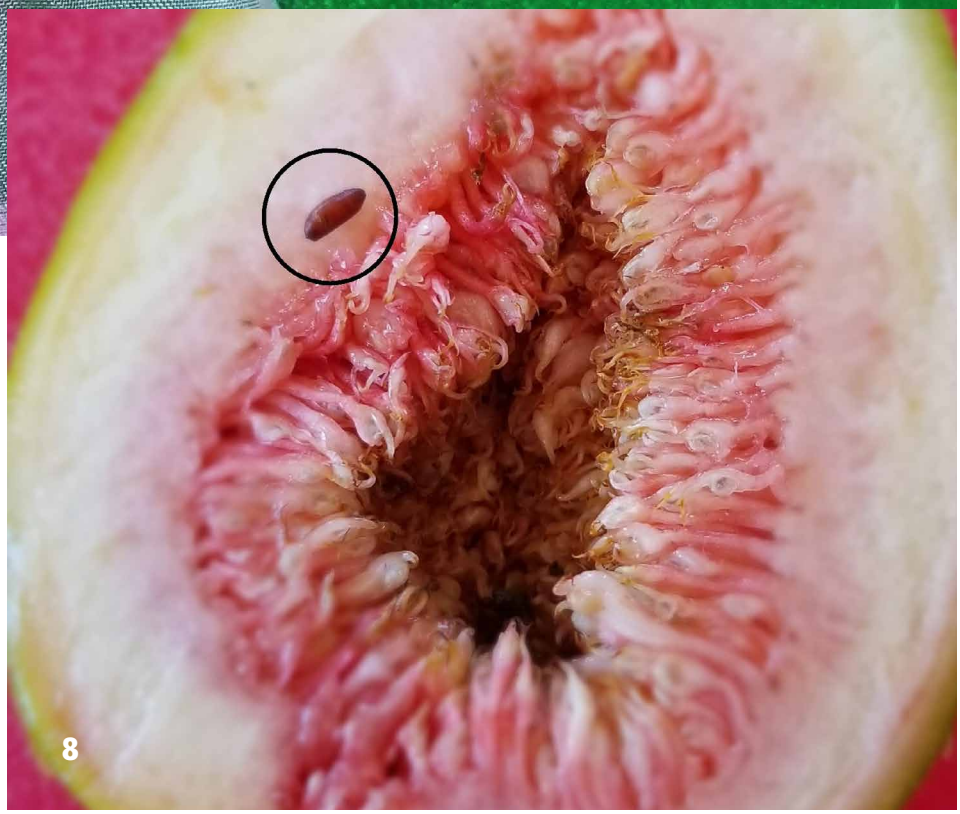

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BLACK FIG FLY

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inside the fig when I put the bag over it. I also had a bagged fig ripen to a perfect yellow, shown in photo 7. It appeared to have no damage, but when I cut it open a brown pupa fell out—photo 8, at right. Be sure to check your figs, unless you like that extra bit of protein!

I can't stress the importance of picking up the fallen fruit as quickly as possible and destroying it. Repeating what I said earlier, ***do not*** put it in your compost bin! I collected some fallen fruit and put them in a container for research but forgot about it. A few weeks later I looked and there was an entire BFF village in the container! I

counted 2 adults, 4 pupae and 2 larvae, all from one small unripe fig!

Houston Wilson recommends disposing of the infested figs either by putting them down the kitchen sink grinder or double bagging them and putting them in the trash can. One last time, *do not put them into your compost pile, worm bin or into your city greenwaste container, because the larvae will emerge, pupate and release adult flies!*

If you have questions or suggestions for control, you can contact Houston Wilson at houston.wilson@ucr.edu.

Jenny Weaver is retired but not tired. She loves working in the garden but does not love dirt under her fingernails! She received a BS in Fruit Science from Cal Poly in 1978. She enjoyed working as a San Luis Obispo County inspector-biologist off and on from 1985 to 2014.