POMONA

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POMONA
The Member-Written, Quarterly Journal of North American Fruit Explorers (NAFEX)
Volume 55.1 / Winter 2022
Gathering Editors: Kris Heeter and Leslie Wade

Letters and Notes

Articles and Items of Interest

Other

All Things NAFEX

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Cover Photo

1940 / Farmers pruning fruit trees. Placer County, California
Photograph: Russell Lee (1903-1986)
Library of Congress Prints & Photographs Division Washington, D.C. 20540 USA
http://hdl.loc.gov/loc.pnp/pp.print

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How to Be a Gathering Editor for Pomona

If you are a NAFEX member in good standing, contact the President, or the current Gathering Editor and request which edition(s) you would like to be Gathering Editor for.

We are looking for a Gathering Editors – for the Spring, Summer and Fall of 2022. The great thing is you get to review content early, and even encourage content of your favorite fruit or topic. It's a great way to meet fruit enthusiasts and find out really cool things about fruit –and yourself!

What do gathering editors do? Reach out to members and relevant organizations to gather articles and content. Gathering editors have approached this a couple of different ways - or a combination of two or three of these:

1) Gather articles that are copyright free and in the public domain (e.g., USDA publications) -- this is the least attractive method unless something new comes out that is of value to members. We're finding that members really appreciate articles from fellow members the most rather than something that's a canned article in the public domain.

2) Talk to fellow growers and ask them to write up a short summary of what they are doing - successes, failures, their experiences for the year, etc. Posing a few questions to the prospective writer to help get the ball rolling helps. The article could be a Q&A style that you type up or they can write an article.

3) Reach out to an expert or two, or an organization, and ask them to write an article. In this issue Gathering Editor Leslie Wade reached out to Dr. Cameron Peace and the editors of *Malus* zine to gain permission to republish Cameron's article on the genetic origins of the Foxwhelp apple.

Thinking about Pomona

"The greatest contribution one can make to one's country is to add a new plant to its culture."

Thomas Jefferson (1743-1826). Throughout his long life, Jefferson maintained a keen interest in botany and horticulture. He studied the diverse plant life of the New World and experimented constantly to introduce valuable European species that might adapt to the rigors of North American conditions. And while he concerned himself with all aspects of fanning, gardening, and animal husbandry, his first love was fruit. – NAFEX Handbook, Copyright 1986.

NAFEX is us. Pomona is a member-written publication. Without you, we have nothing to say.

We encourage you to write a letter to your fruit-growing friends when you submit to the Pomona; you need not write a scholarly article, though we welcome those too. Tell us what fruits and nuts you are growing, how they are doing in your locality, what special techniques you may have used to enhance your fruit's success.

Here are some suggested categories, but feel free to submit something that would fall under a different heading:

- Garden Mistakes
- Lessons Learned
- Eureka Moments
- Recent Successes
- Outstanding Varieties
- Pruning Tips
- Training Tips
- Grafting Tips
- Getting to know your fellow fruit explorers—including yourself! Send us a sketch of you and your growing interests.

Ideally, each NAFEX member would submit something for publication at least once every year. Subject matter can be anything that deals with fruits and nuts, occasionally venturing away from the basics. Good subjects include description and evaluation of an unusual variety; new variations of a propagating technique; a progress report on an experimental breeding or testing program; new methods of fruit culture, training, or pest control, or simply new grower perspectives or questions.

In addition to hearing your experiences, we need to know your ideas for updating our organization to make NAFEX as useful as possible. Please let us know what you think. This feedback process is in keeping with NAFEX's Round Robin heritage. Please check your facts, as much as possible.

How to Submit Articles to Pomona

Please send your copy to the appropriate Gathering Editor or admin@nafexmembers.org by the deadlines below.

Spring and Summer 2022 - **volunteer to be a gathering editor!**

Deadline for Spring 2022 submissions is March 31st

When you are referencing a specific variety of fruit, please bold the variety name. It helps the reader. If your items are too large to email, please reduce image file sizes to 1 MB or less and send as individual files If larger pictures are required please contact the Gathering Editor to discuss. Articles can be very short or long. Please submit articles in Microsoft Word (.doc or .docx) format. Articles can also be accepted in.PDF or other formats if need be but Word Documents are preferred. Please submit image files saved as .JPG, .TIFF, .PNG, or .GIF.

Letter from the NAFEX President

Dear NAFEX members,

Welcome to 2022 and what will hopefully be a good growing season for us all!

I hope that the 2021 NAFEX Virtual Conference held in November inspired many! What an amazing lineup of speakers and fabulous discussions. If you missed the conference, all sessions were recorded and you can view those online when you login to www.nafex.org.

While many of us miss the in-person conference experience, the ability to offer sessions online does have its advantages, namely there's no cost to attend and there is no lost time in traveling. With that in mind, the Board is moving forward to bring more virtual meet-ups available to members online. Based on feedback from our December survey, we are working to bring topics and speakers to you throughout the year, in addition to our Annual Conference.

Coming up in February, we'll have a Zoom meet-up discussion on red-fleshed apples with Derek Mills on February 9. Later in the month, on February 21, we'll have Dr. Lee Reich give a presentation on winter pruning. The details for both are in this issue. These are just the first of many to come – one more perk of being a NAFEX member!

We had two items for members to vote on as an extension of the Annual Conference and Meeting. Members overwhelming voted in the three nominees for the Board of Directors: Adam Bigham, Nick Kasko, and Taylor Yowell. Members approved the amendments to the Bylaws that were put forward for a vote by email and regular mail in December. The updated Bylaws can be found on the NAFEX website.

In this issue, you'll find a variety of articles submitted by members, including two from our Claypool-Lehman Research Fund recipients – Richard Fahey and Nicholas P. Howard (we awarded four awards in 2021). With permission from Dr. Cameron Peace and the *Malus* zine, we have included an article on Foxwhelp apple DNA profiling.

In this issue, you'll also find an update from the U.S. National Plant Germplasm System (NPGS). As some of you are aware, NPGS is having a very difficult time meeting the increased demand for the resources they house and maintain. On behalf of NAFEX, I have been in communication with NPGS the past couple of months and we recognize the difficult position they are in.

NPGS is screening through an increasingly large number of requests, many of which are not bona fide. Unfortunately, there have been a growing number of instances at all repositories of people providing false information about who they are and and/or about the intended use of the materials they are requesting. The screening needed to go through all requests is incredibly time consuming. Materials from government-funded repositories like NPGS and all the animal repositories do require justification from those who want to acquire material. Repositories must report back to their funding agency annually on how those materials are used, and who they go, to justify the funding needed to keep operating.

I shared the NPGS article that is included in this issue with the Board last month and we discussed this at our Board meeting. Collectively, we are committed to supporting NAFEX members and NPGS as best we can and are discussing ways we help. As one of our Board members noted: the most important point in the article is they need folks to fill out the field explaining justification for requesting the material (also see the article's second bullet-point, also mentioning "need" vs. "want"). We will look into ways that we (NAFEX) can help support our members who need these materials for important research. In addition, we may try to compile resource lists, e.g. other organizations or nurseries where duplicated materials can be procured. Perhaps we can help take the pressure off of NPGS by helping folks find where varieties are duplicated.

If you do have a breeding or research project you are considering, whether it requires NPGS materials or not, you may wish to consider applying for a small grant from our Claypool-Lehman Research Fund. Details on this research fund and how to apply in are in this issue. While these are not huge grants, they can help offset some expenses on important research projects.

As I finish wrapping up this issue, I'm enjoying the beauty of the snow that has blanketed the Midwest. Being "snowed in" allows me to physically slow down a bit and allows for time to think about the upcoming growing season. I'm looking forward to expanding my orchard a little more, adding more apple, pear, peach, plum and blueberry varieties, and dipping my toes into the world of grapes for the first time. If any of you have some favorite varieties you like to grow, I'd love to hear about them!

Happy growing!

Kris Heeter
aka Kris Klueg, Ph.D. (Indiana University)
NAFEX President and POMONA Editor

MINUTES
NAFEX Board of Directors Meeting

January 31, 2022; 7:30 pm EST
Via ZOOM

Attending: Kris Heeter, Taylor Malone, Chuck Wilson, Leslie Wade, Chris Homanics, Tim Lussier, Jorge Zaldivar, Larry Stephenson, Adam Bigham, Taylor Yowell, Nick Kasko.

7:35 pm – Meeting called to order by Kris Heeter

1) President's Report:
    a. Kris shared that the recent bylaws updated passed with the following vote: 49 in favor – 1 opposed – 1 abstained.
    b. All officer positions are filled with the exception of the Secretary position.
    c. She also shared that because of the success of the 2021 conference, our membership more than doubled to more than 700.

2) Election of Secretary
    a. Leslie Wade was nominated by Chuck to serve as Secretary. Larry seconded the motion. The motion passed unanimously.

3) Interest Groups
    a. Kris said she worked with Barbara Rosholdt and Nate Conn to update the list of Interest Groups and Leads. The list appears on the website and in the POMONA.
    b. Goal: To try to offer monthly interest group meetings going forward. We polled members before and after the conference and have a list of topics of greatest interest.

c. Leslie has organized two upcoming sessions: an Apple Interest Group meeting on Feb. 9 with Derek Mills and a Winter Pruning workshop with Lee Reich on Feb. 21.
d. Kris said she is working with some of the speakers from cancelled sessions from the Purdue small growers conference to make them NAFEX events. Leslie mentioned that we'll need to figure out how to integrate these events as free public events alongside our member-only events.

4) Welcome of New Board Members
   a. Adam Bigham, Taylor Yowell and Nick Kasko briefly introduced themselves. The other directors warmly welcomed them.

5) Financial Report
   a. Chuck reported that we've had very little activity since our end of year financial report for 2021. He said he would forward the updated income and expense information to Kris for distribution to the board.
   b. Kris mentioned that we have funds to issue as Claypool/Lehman grants in 2022.

6) New Business
   a) 2022 Annual Conference – Kris said she would like to see virtual access for all future conferences and that, given the continued pandemic, the 2022 event should be virtual only. She said she would like to see the conference planning get underway soon and asked board members to volunteer.
   b) Board Member Participation – Leslie suggested that each board member decide which subcommittee(s) they'd like to become actively involved in. Kris said she would send out a survey to all of the board members to get their input. Committees would include:
      a. Programs & Conference Planning
      b. Social Media & Communications
      c. Finance Committee (grants)
      d. Interest Group Management
      e. Others
   c) USDA Germplasm Repository
      a. Kris reported that she's been in communication with the major repositories about their policies for sharing germplasm. There have been recent discussions on our NAFEX Facebook group about those policies and frustration among non-institutional fruit growers. She added that all of the repositories are very short staffed and that their policies may not be effectively communicated. She added that we might help by suggesting that our members try to acquire germplasm from other sources first.
      b. The board discussed some of the frustrations with the process and the variability of working with different repositories.
      c. Kris has solicited an article from the repositories on their policies for publication in the next POMONA. She invited comments from board members about the article prior to publication.
      d. Kris suggested we continue the conversation to develop methods for our members get what they need. That message will be reflected in the Editor's Note after the article in the POMONA.
   d) Announcements
      a. Leslie said she is looking for a speaker for our March grafting workshop. Taylor Malone and Taylor Yowell volunteered to be the main presenters and other board members offered to add their expertise during the workshop as well.

9:05 pm – Leslie Wade moved to adjourn the meeting. Chuck seconded the motion and it passed unanimously.

Introduction to our newest Board members:

Adam Bigham

Adam Bigham is a certified Human Rights Consultant living in Comstock Park, MI, and a lifetime member of Michigan Nut and Fruit Growers Association (MNFGA).

Adam studied Horticulture at Michigan State University and has been propagating fruit trees by seed and grafting since 2004. Apples and pears are his main focus, but he also has interests in tart cherries, Japanese and hybrid plums, blueberries, pawpaw and Cornelian cherry.

Adam is a past recipient of the Claypool Research Fund grant, and continues working on breeding new varieties of pome fruit from heirloom seeds, with goals of genetic diversity, including novel sources of fire blight resistance from neglected sources like '**Greensweet**' apple or '**Sucre Verte**' pear.

Nick Kasko

Nick grew up in Bellingham, Washington and fell in love with agriculture as a kid, seeing his dad plant many fruit trees and learning to graft from his dad.

His grafting journey continued when he to school. He researched a lot about farming while studying Mechanical Engineering at EWU. He would graft trees during spring break and enjoy fruit during the summer. He has continued to dive deeper into farming and permaculture.

He has been experimenting with inter-stem grafting and other beneficial rootstock and cultivar combinations, which would allow fruit to be grown in soils where it was unable to grow before and testing many different varieties of fruit to find the varieties most suitable for his climate. He now has around 200 varieties of apples, 30 varieties of pears, 40 varieties of plums, cherries, peaches, apricots, mulberries, nuts, cold hardy citrus, and more.

Taylor Yowell

Taylor and his wife, Marbury Jacobs, own and operate The Garden Farmacy, LLC, located in central Mississippi. Taylor's mission is to create a successful business model, based on regenerative and agroforestry concepts, to share with future young farmers.

Taylor has collected 170+ varieties of fruit trees, over the past 12 years, which are all currently planted on his farm. His fruit tree collection is used to provide scionwood for his young fruit tree nursery. The Garden Farmacy, LLC will also start online fruit scionwood sales beginning Winter 2022, to help diversify their business model.

NAFEX Membership Renewals – Online or by Mail

$19 - One year for Digital
$25 – One year for Full Membership (Digital + Printed POMONA)

$36 - Two year for Digital
$50 – Two year for Full Membership (Digital + Printed POMONA)

$52 – Three year for Digital
$75 – Three year for Full Membership (Digital + Printed POMONA)

Renew online at: https://nafex.org/index.php/membership-account/membership-levels/
If renewing online and choosing full membership, please email us the address you wish the printed POMONA to be sent to: admin@nafexmembers.org

Or mail checks to: Charles Wilson, NAFEX Treasurer
1375 Willowbranch Rd., Jacksonville, IL 62650

Are You Missing Some of our Emails?

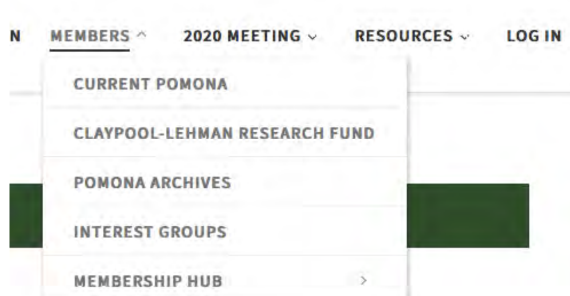
Here's a tip to be sure our emails reach your inbox. NAFEX uses MailChimp to send a limited number of emails to members about programs and news. Sometimes emails land in a spam/junk folder or in Gmail's Promotions tab.

If you use Gmail, search your Promotions tab for "NAFEX." Right click on our message and click "Move to Tab" (at the top), then choose "Primary." A pop-up screen will ask if you want to apply this to all future messages. Just click, "Yes." If our messages end up in your Spam folder, just use the ame trick.

If you use Outlook, go to the Home tab. Click Junk > Junk Email Options. Select the Safe Senders tab and click Add. In the Add address or domain box, enter admin@nafexmembers.org to add us to your safelist. If you use another email app just do a web search for the instructions to take a similar action.

Watch the recorded the 2021 Annual Conference meeting and recorded "Interest Group" roundtables online

Watch the recorded the 2021 Annual Conference meeting, the recorded Interest Group Roundtables, and get updates on the monthly ZOOM Interest group chats when you log into your member portal on our website: www.nafex.org

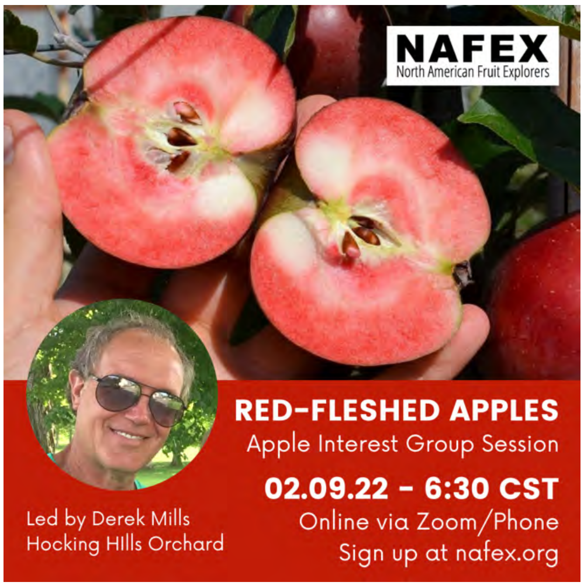


Upcoming Programs – Join us Online via ZOOM or by Phone

NAFEX is working to develop informative programs for members of all experience levels. In 2022, we'll convene member-only meetings of our fruit-specific Interest Groups.

For more information about our current Interest Groups, visit the Interest Group page in our Members section at nafex.org. If you'd like to lead an Interest Group, we'll help you organize virtual or in-person meetings. Just email us at admin@nafexmembers.org.

APPLE INTEREST GROUP MEETING
Wednesday, Feb. 9, 2022 - 6:30 PM CST
Via ZOOM or by Phone



Red-fleshed apples are gaining in popularity.

Explore the history of these beautiful and useful cultivars with Apple Interest Group chair Derek Mills of Hocking Hills Orchard. The meeting will be held via ZOOM and phone.

Our interactive interest group meetings are open to all NAFEX members in good standing. Please bring your red-fleshed apple stories to share!

Registration: Members will automatically receive an email with the ZOOM link and telephone call-in numbers. Just be sure your email is current by logging in at nafex.org.

WINTER PRUNING WORKSHOP
with Lee Reich
Monday, Feb. 21, 2022 – 6:30 PM CST
Via ZOOM or by Phone

Correct and timely pruning are the keys to keeping apples, peaches, and other fruit trees healthy and productive and bearing the tastiest fruits.

Learn the how and -- importantly -- the why of pruning these plants in their young, developing stage and then as they mature and bear fruits.

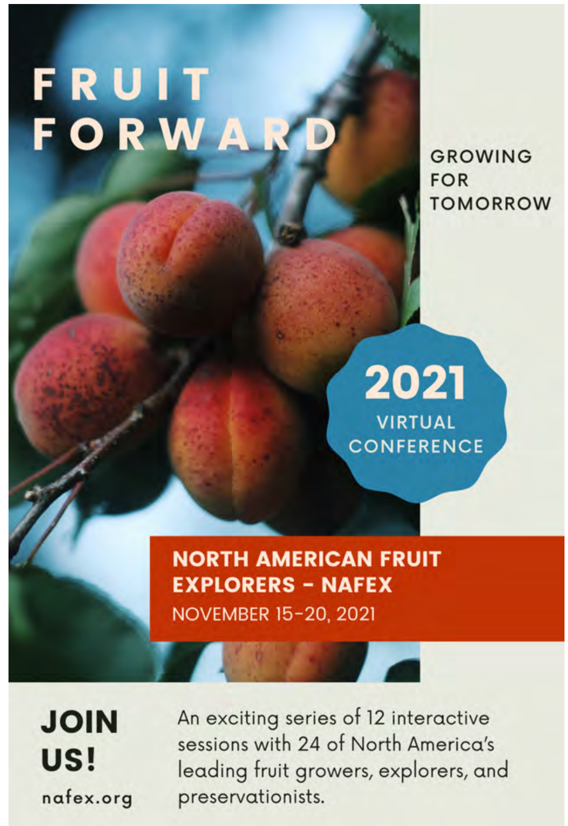
You don't like to prune? We'll talk about some fruit trees that need (almost) no pruning. You really like to prune? We'll touch on espalier too.

Registration: Members will automatically receive an email with the ZOOM link and telephone call-in numbers. Just be sure your email is current by logging in at nafex.org.

NAFEX 2021 Virtual Conference Recap

All Recorded Sessions Available Online

Our 2021 virtual conference, Fruit Forward: Growing for Tomorrow, was a great success.



Our all-volunteer Programs committee and board organized 12 sessions that were recorded in both video and audio for later viewing. These sessions will be available to NAFEX members only through the fall and then will be shared on our NAFEXTV YouTube channel.

Michael Phillips of Lost Nation Orchard served as our keynote speaker and delivered a must-watch presentation on holistic orcharding from the soil up. Other session topics included: getting started in fruit growing, preserving heirloom apples, permaculture, agroforestry, peaches grown by Southwestern Native Americans, plum and pear breeding and genetics, pawpaws and persimmons, and discovering wild and heirloom fruit trees.

The conference also included the 2021 NAFEX Annual Meeting and a fun Member Show and Tell Happy Hour. We'll be sure to repeat the member show and tell event in the future. It was great to see what everyone was up to!

NAFEX is grateful to each of our 23 speakers and session hosts. If you missed one or more of the sessions or want to access some of the FREE resource files you can access all of the conference resources here!

Special Thanks to One Green World Nursery

Fruit Forward: Growing for Tomorrow was generously sponsored by One Green World Nursery.

One Green World is a family-owned retail and mail order nursery located in Portland, Oregon that specializes in fruiting trees and shrubs from all over the world that are well adapted to the Pacific Northwest.

In addition to the many fruiting trees and shrubs they grow, they also stock a large number of climate-adapted Mediterranean plants, perennial vegetables, and orchard companion plants. Visit them online today at onegreenworld.com.

Letters to NAFEX

From: Mary Yett
RE: recordings of the NAFEX from the virtual 2021 conference

I was working and unable to participate during the original conference and would love to watch the replays. How do I do this? I have rejoined as a paid up member. Actually, I have been an on again/off again member since the late 80's and still have boxes of old paper Pomonas. NAFEX has been a big part of my journey toward establishing my permaculture farm and planting over 1000 useful trees and shrubs in Food Forests on it. I am deeply grateful to have been a proud NAFEXian for so many years, and am really impressed with what you guys have done with this virtual conference. Thank you!

Editor's note: *We replied directly to Mary, but for those who missed the conference, see information in this issue of the POMONA on how to access the 2021 Conference Recordings!*

From: John Bunker

I'm so glad to learn that NAFEX is alive and thriving. I confess that I'd lost touch a bit over the past few years. I still have many years of the old paper Pomonas on a shelf near my desk and find myself roaming through them from time to time to find an article I've never forgotten.

I know a number of the speakers quite well in this year's conference series, as you might imagine. In fact I just spent most of last Saturday with Matt Kaminsky at an event in NY. And Dan and Michael are close friends. I'll look forward to tuning into Joseph Postman's talk as well as the Exploring session you mentioned.

Please think of me in the future. Perhaps I can contribute to NAFEX with articles, talks etc. Thanks again and all the best, JB

Editor's note: *We will definitely take John up on his offer to contribute to the POMONA and future conference and interest group session. In addition to founding Fedco Trees and the Maine Heritage Orchard, John also has a great book we recommend*: "Apples and the Art of Detection: Tracking Down, Identifying and Preserving Rare Apples" **https://www.outonalimbapples.com/store/book2**

From: Scott Peterson / poemwriterscott@gmail.com

RE: Seeking Scion
I am seeking scion wood for spring grafting. I'm in USDA zone-7a. I've given up on some sources because the wood is old/ dried out / zero takes. I am also trying to find someone to teach pruning / grafting class to volunteers of new community farm project here on Cape Cod.

From: Linwood Watson / wood328@yahoo.com

Kris, hello this is Linwood Watson and if memory serves me correctly you were the gathering editor when I submitted my old Cornell book summary on NY apple storage. I wanted to drop a line saying "thank you" for all your leadership-especially during covid- and while I am have only been around a few years, this past Pomona was especially impressive to me. (Note I cc'd Jorge as he was gathering editor for this issue).

This most recent Pomona, which I relished in print, had it all. There was cutting edge academics on powdery mildew, hard core practical knowledge from non commercial growers in the trenches (Jourdan's- Cherries I have Grown- *you know it is a good article when it lists varieties you should not grow!),* honoring of the past with Yowell's heirloom southern apples, and funny, real world, grower to grower, misery loves company esprit de corp from Wade's "If you could go back in time..".

And what do you know, the old book lover in me even savored the 2-acre orchard summary on the 1901 ag report. (That was a packed orchard!!)

The entire issue was the epitome of why I joined NAFEX and what I had hoped for. A sincere thank you to both. Stay safe, and never fret (even if you do not directly hear it)- your efforts are making local, unseen differences in the fruit world. These old fruits (and new ones suited to home culture) need a voice. Covid has proven the world is not flat (to use an economic term), and self sufficiency, sharing with neighbors, and local market support are packed with maybe not economy of scale, ***but the economy of resilience.*** Thanks for bolstering the resilience, and yes, I am now off to fight some deer:)))

Linwood Watson, NAFEX member, AspenSkye Orchard, Fuquay-Varina, NC

From: Non-member / RE: Grape Cuttings

Hello, I was wondering, as your group is composed from fruit growers from around North America, if you were aware of anyone selling grape cuttings. I am interested in Fernao Pires, Trincadeira, Touriga Nacional, Touriga Franca, and Alvarinho. Thank you for your time. - Sara

Editor's note: If you can help with this, please email us at admin@nafexmembers.org and we'll put you in touch with Sara.

From: Non-member / RE: Orchard Consultant Needed

Hi there, I am wondering if anyone at NAFEX does any farm consultation? We have a 10-acre field which we have planted in the style of the Permaculture Orchard (Stephan Sobkowiak). 28 rows of mixed fruit trees (apples, pears, peaches, plum, cherries, quince, service berries, etc) with a nitrogen fixing tree every 4th tree and understory plants (fruiting shrubs, herbs, flowers etc). However, most of the trees however are not doing very well (whether that is due to excessive moisture, or our location, soil, etc). and we are trying to change our farm plan accordingly and are looking for farm consultant. Thank you, Kyla Werlin

Editor's note: If you are a consultant and would like to reach out to Kyla, please email us at admin@nafexmembers.org and we'll put you in touch with her.

Remembering Pete Tallman / NAFEX Member

Peter Tallman of Louisville, Colorado, passed away peacefully the morning of March 1, 2021 after a long struggle with colorectal cancer and Parkinson's disease. He is survived by his wife of 51 years, Ellen

(Maher) Tallman, daughter Kate Tallman (husband-Jake Williams) of Lafayette Colorado, and son Michael Tallman (wife-Leah Costello) of Hinesburg, Vermont. His grandchildren Rylee and Marlo Williams (Colorado), and Theo, Iris and Ruby Tallman (Vermont), brought him much joy.

Peter had a lifelong passion for gardening. Inspired by a trip to Europe in 1985, he learned techniques to graft scion wood to grow dozens of heirloom varieties of apple trees in his yard in Wappingers Falls, New York. After early retirement from IBM, Poughkeepsie, Peter relocated to Colorado in 1993 to work at StorageTek, and adapted his fruit growing techniques to the mountain west that included growing apples, blueberries, black raspberries, and sweet and sour cherries. He continued a project begun in New York state to develop a new breed of fall bearing black raspberries which he patented and assigned the name of 'NIWOT,' becoming commercially available after Peter's retirement from StorageTek where he worked for 10 years.

Thoughts and memories of Pete shared online by current and former members:

"Recently I suggested Pete Tallman as a possible speaker at the next Independent plant breeders conference that will be held in Denver 2023. Unfortunately, while looking Pete up I learned he passed away in March. Pete is best known for introducing Niwot, a double cropping or primocane black raspberry. It all started with a black raspberry he found fruiting in October in the wild. Pete had some guidance from professional breeders but he did all the work to create this ground breaking berry. Besides the primocane quality, it is a fine berry. This spring I was going back and forth trying to decide whether Niwot or Jewel tasted better. Pete was a fine gardener, fruit grower and excellent NAFEX member." – Mark Wessel

"He was a common sight in my earlier years of NAFEX. He made a few presentations on his work and was a strong supporter of NAFEX as many members guided him on his knowledge path. He spoke of this fact often and really enjoyed the communion with other members. In fact, if I remember a few of his early successes were named after the organization. He was free to share what he had learned and gave back to the group through his passion and advocacy. He will be missed. I can only hope others will be able to pick up the torch and build upon the work he has done." – Rob Hamilton

"I'm sorry to hear about Pete. I learned of him because I had an interest in growing blueberries in Colorado, which can be tricky with our alkaline soil. I remember reading an article about how he had dug a big hole and stuck an entire bale of peat in there, and grew blueberries that way. I never actually tried it, but his innovation gave me hope about gardening in Colorado. I had no idea he was so accomplished in so many areas." – Ti Phillips

"Thanks for [sharing] this. I had not heard. Had lots of correspondence him on black raspberry breeding and on the PF trait over the years, and enjoyed visiting with him when he came to our plots in Corvallis a few times. Sad news." – Michael Dossett

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On the progress of pedigree reconstruction research in apple and cherry

By Nicholas P. Howard / howar622@umn.edu

Greetings NAFEX members. My name is Nicholas Howard, and I was asked to write a short summary of my recent research published with colleagues on pedigree reconstruction in apple and cherry. Before getting into that, I will provide a little background to provide context for this work.

I received my PhD from the University of Minnesota in 2017 working in the legendary apple breeding program there under Professor Jim Luby. While there I identified and then published a paper on the long-lost true pedigree of '**Honeycrisp**'. That pedigree information ended up being very useful for my other research at the UMN and so I thought it would be interesting to see if I could make similar discoveries with more data. I asked and received from Jim some resources to do a small pilot study on this topic. The initial results were very promising and so I decided to pursue this topic for my post-doc research. Initially, I wanted to identify the European ancestors of new-world cultivars and how all major market cultivars were related to one another, but the project quickly grew in scope.

To figure out how European cultivars were related to new-world cultivars I realized I needed to go to Europe for this work. So, after I received my PhD, my wife and I moved to Oldenburg, Germany for a (75%) post-doc position where I spent much of my time on this topic. Jim also graciously offered a 25% post-doc position at the UMN for additional support. Once in Europe, I started collecting leaf samples from various state and privately held apple collections. With these samples, I had the DNA extracted to have it analyzed on what is called a "SNP-array". SNP means Single Nucleotide Polymorphism, which is the most ubiquitous, common type of genetic marker. The "array" part means a physical chip that contains thousands (in this case, 18,017) DNA probes for SNPs that provide information about what alleles, or in other words what DNA letters (A, C, G, or T) are present for each individual at each SNP. SNP arrays are the technology used in popular human genotyping services like 23andme and AncestryDNA, etc. I also petitioned scientists across the globe to receive additional samples and additional SNP array data from material that had already been analyzed. In the USA I sampled many accessions from the Seed Savers Exchange, the Temperate Orchard Conservancy, and particularly from the USDA collection in Geneva, New York. In total, I have received data and/or samples for over 8,000 cultivars and accessions (wild, breeding, etc.) from over twenty countries across four continents.

I then used this genetic information for the pedigree reconstruction research. The basic ideas behind these methods are conceptually similar to those used in the commercial human genotyping services previously mentioned. However, there are some important differences between apples and humans and between the genetic/genomic resources available for these species that necessitated the development of additional or altered techniques for working with the apple data. This in turn meant that before we can share all the new pedigree reconstruction results, we have been needing to first publish a series of papers on these methods.

This brings me to the paper that was recently published, which is one of these methodological papers. The long-winded title of the publication is, "The use of shared haplotype length information for pedigree reconstruction in asexually propagated outbreeding crops, demonstrated for apple and sweet cherry." Key collaborator and coauthor Prof. Dr. Cameron Peace of the Washington State University added cherry data to the study. The methods described in this paper are rather dense and hard/boring to get through for non-scientists, but the basic idea is that we described ways to identify the areas of the genome (called haplotypes) that pairs of individuals have in common, we summarized that information, then used that information for inferring the level of relatedness between those pairs. While the methods don't make for good reading, buried in the paper are some pedigree reconstruction results that would be of interest to enthusiasts of old apple and cherry cultivars.

The results for apple are as follows:

A group of 29 cultivars were found to share an unknown parent. This group mostly contains European cultivars, but one is '**Sturmer Pippin'**, which is one parent of '**Braeburn**'. A full list of the other half-siblings is included in the paper. The pedigree of the unknown parent of the classic English cultivar 'Cox's Pomona' was identified. This pedigree includes '**Reinette Franche**', **'Reinette des Carmes'** (both common ancestors of many European and new-world cultivars), and **'Golden Harvey'**. Finally, **'Fameuse'** was deduced to be a likely grandparent of '**McIntosh'**. A connection between '**Fameuse'** and **'McIntosh'** has long been suspected but never previously confirmed.

The results for cherry are as follows:

A full-sib relationship was deduced for **'Emperor Francis**', and **'Schmidt'**, a half-sib relationship for **'Van'** and **'Windsor'**, and the paternal grandparents of **'Stella'**, '**Napoleon**' and **'Emperor Francis'**, were confirmed. Dr. Peace would be needed to provide a more colorful commentary here, as I am not so knowledgeable about cherry cultivars.

With this paper published, my colleagues and I are one step closer to sharing a treasure trove of apple pedigree relationship information elucidated via my post-doc research, which will include many classic US cultivars. I can't yet say when this will be available, but I hope in 2022.

A Promising Pear and a Search for Identity

By Jerry Larson / 300 McClain Dr. McDonough, GA 30252-6115 / 706-825-0217

In the mid 1990s, as an extension agent with Fort Valley State University, stationed in Swainsboro, (Southeast) Georgia, I enjoyed demonstrating pear grafting to a few small-scale farmers. One variety we used was labeled **Le Conte**, from the FVSU demonstration orchard. The resulting trees provided much improved fruit quality and better fireblight tolerance.

During the next 20 years, I continued grafting this variety in four neighboring counties at Fort Valley and in the Tallahassee, FL area with equally good results. In 2016, Ison's Nursery, west of Griffin, GA, offered in their catalog the **Le Conte** pear. Their picture and description were very different from my "**Le Conte**." I called and mailed fruit samples to two fruit specialists, Dr. Dave Lockwood in Tennessee and Dr. Gerard Krewer in Georgia. Both confirmed the sample was not **Le Conte**, but they were not able to identify it as a named variety. They both enjoyed its eating qualities.

As a result, I have named it **Gold Crisp** to describe its color and texture at optimum ripeness. D.N. Griffith of Dadeville, AL, contributed an insightful article, "Southern-Cross Pears" to the Fall 1988 publication of POMONA (https://nafex.org/wp-content/uploads/2019/04/1988-4-Fall.pdf#page=15). His description for the "Southern cross-bred pears" on p. 27 provides a good fit for **Gold Crisp**. He mentioned the beneficial qualities of "crisp-fleshed and ready to eat when picked" and good length of storage time. In addition, **Gold Crisp** is large, pleasantly sweet, and juicy, with low grit and chewable skin when picked mid-August to early September, at optimum ripeness. Flesh sweetness is high enough in mid-July to permit about three weeks of early harvest, for peeling and fresh eating or baking.

Much of my grafting in Augusta, GA, has been on volunteer wild Bradford pear trees (*Pyrus calleryana*), with 3-6" diameter trunks. Eight-year-old grafted trees with good yearly pruning and fruit thinning are now producing good, consistent yields of high-quality fruit. Fruiting began in the third year. I have had excellent results with bark grafting from mid-March to early April, at about a 30" height on the trunk. **Gold Crisp** is partially self-fertile. For isolated trees, I include a **Maxine** or **Kieffer** scion for developing the first scaffold branch to provide a second source of pollen. One central tree in a group of four or five may be solely a pollinator variety graft. Careful attention should be given to a monthly summer pruning schedule for at least the first three years, to develop good permanent branching. Branch spreading to a 60° angle, removing fireblight, and preventing unwanted suckering should all be done.

In mid to late April, with a ½" diameter fruit size and a heavy fruit set of 4-5 per cluster, each cluster should be thinned to 1-2 fruit. This promotes a crop of consistent fruit size and yield from year to year. Fruit lightly damaged by bitter rot, birds, or wasps should be picked and used weekly beginning in mid-July. **Gold Crisp**, as an early pear with low pest pressure, works well for organic growing. An organic grower near Waynesboro, GA, quickly markets his **Gold Crisp** crop each August.

I do collect extra scion wood each January for sharing and distribution in February. Based on a fruit sample I sent to Larry Stephenson in Cold Water, MS, I will be mailing his scions first. Others here in the Southeast who are willing to follow the first three years' summer pruning/management plan and give a brief yearly report are eligible for six scions and my detailed methods for bark grafting. The cost of mailing is $5, and I would appreciate your help with that. With this being the first year, I may only be able to fill orders for the first ten requests I receive by 3/10/22. Otherwise, your request can move to 2023. I would like to see some different states represented. Afternoon calls, Monday - Friday, would be best, made to 706-825-0217.

Foxwhelps and fauxwhelps: Insights from DNA profiling

by Cameron Peace, John Bunker, Greg Peck and Nicholas P. Howard

Foxwhelp has been suffering from an identity crisis, but recent DNA profiling is setting matters straight. The real **Foxwhelp** can now stand up. (Spoiler: it's **Old Foxwhelp**.)

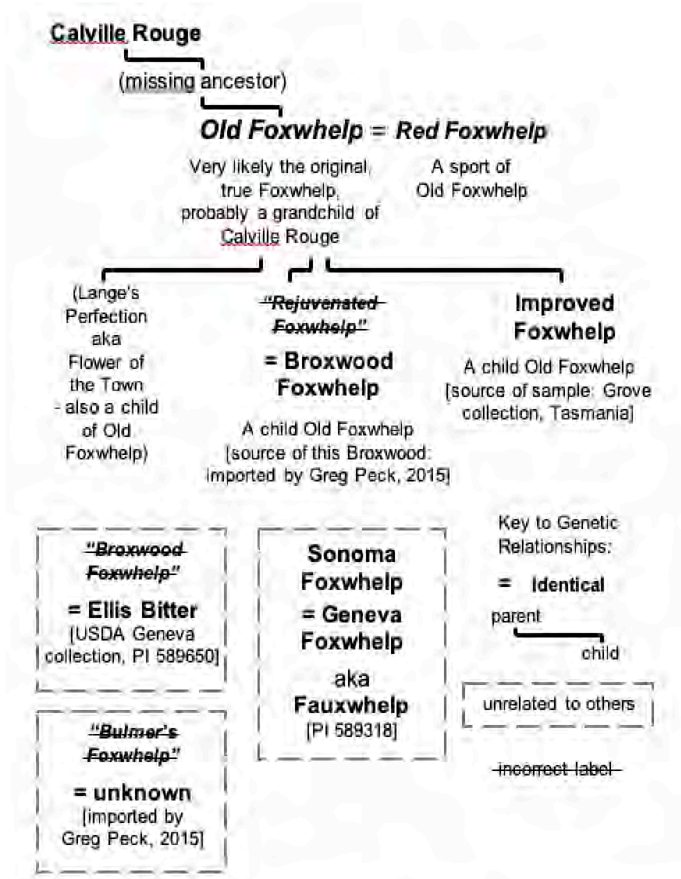
As John Bunker described in the *Malus* Issue 10 article, "Will the real **Foxwhelp** please stand up," several posers have been hanging out in cider circles wearing a **Foxwhelp** name tag. The cast of characters as described in that piece included four imported by John that are set to soon be out of quarantine and ready for distribution. Those four–**Old Foxwhelp**, **Red Foxwhelp**, **Broxwood Foxwhelp**, and **Rejuvenated Foxwhelp**– were lined up for our recent DNA profiling, along with the accession held by the USDA repository in Geneva, NY, now more commonly known as **Fauxwhelp**. Another one we examined was **Sonoma Foxwhelp**, a selection that is said to have made it to California in the 1970s or 80s, separately from the accession in Geneva, and has been available as nursery stock since then. Also included in the analysis was a sample of **Bulmer's Foxwhelp** and a **Broxwood Foxwhelp**, both imported by Dr. Gregory Peck of Cornell University from a source different from John's, and one of **Improved Foxwhelp** from a collection in Tasmania, Australia.

DNA profiling technology available and in use for apple is powerful. In the past decade, the high-resolution method of Single Nucleotide Polymorphism (SNP) array analysis has been applied to thousands of apple cultivars. Several SNP arrays have been developed by apple genetics researchers collaborating internationally, but the so-called 20K version is most commonly used. With this DNA profiling tool, about 10,000 known positions along each of the 17 chromosome pairs are examined for each apple individual. For purposes of identity checking, this tool is more than 100 times higher resolution than the Simple Sequence Repeat (SSR) technology applied to apple you might have heard about. It still can't tell sports apart, but the higher resolution makes it very simple to detect parent- child relationships with certainty. It also enables the deduction of more distant pedigree relationships where the connecting ancestors are missing.

The Original Foxwhelp revealed

When we applied the 20K array to the above **Foxwhelp** cast, we found the original, a sport, two children, a different cultivar, and some quite unrelated (Figure 1). The evidence is strong that the **Old Foxwhelp** imported by John is the original **Foxwhelp**. The pieces of evidence for this conclusion, considering also information in John's earlier *Malus* article, are: (1) its name; (2) the origin of the source material for this sample; (3) the DNA profile identity-matching with **Red Foxwhelp**, with the latter long suspected to be a sport of the original; (4) the phenotypic matching, that is, the same set of physical attributes, of **Old Foxwhelp** and **Red Foxwhelp** to descriptions from hundreds of years ago, including being bittersharp, roundish-conic, long-stemmed, and almost without a basin; (5) its placement in the pedigree a generation above two of the other **Foxwhelp**s; (6) its parentage of **Broxwood Foxwhelp** and **Improved Foxwhelp** corresponding with the suspected origins of those cultivars, and (7) the pedigree connection of **Old Foxwhelp** to **Calville Rouge**, an ancient cultivar that we've been realizing (thanks to SNP array analysis) is in the ancestry of a large number of heirloom and modern cultivars.

Figure 1



Genetic relationships among some Foxwhelps revealed by recent DNA profiling (using 20K SNP array). Names in italics were imported to the U.S. in 2012 by John Bunker, released provisionally from quarantine.

The work has just begun

These results are not the final say in identities and family ties of the cast of The Foxwhelp Show. For starters, there are some other individuals out there with **Foxwhelp** name tags, such as **Black Foxwhelp** and **Russet Foxwhelp**. What's also needed is to test identity-matching among the many sources of trees in the U.S., England, and elsewhere labeled currently as **Foxwhelp**, **Old Foxwhelp**, **Red Foxwhelp**, **Improved Foxwhelp**, and so on. It's clear that already there are labeling mix-ups among these versions, with some masquerading as others. Similarly, there are identity mix-ups and mysteries among many other cultivars in the cider industry. Naming confusion has also been rife among dessert cultivars, whether heirloom or modern.

What is clear is that budwood is easily mixed up, even by well-known nurseries and research institutions, and both phenotyping and genotyping are needed to properly identify these centuries-old varieties. It will take a concerted effort by researchers, nurseries, and others who grow and distribute cider apple trees and budwood to sort things out, but these mysteries are increasingly being resolved. An international network of apple genetics researchers and diversity collection managers are accumulating DNA profiles for thousands of cultivars from various sources, and we're in the thick of it. Meanwhile, we await final release of the Foxwhelps that have been through the USDA Animal and Plant Health Inspection Service (APHIS) program. As soon as we get the okay from APHIS, we'll be disseminating **Foxwhelp** budwood to excited cider makers from Maine to California. Perhaps we should include a long-lasting, pre-stamped, DNA-symbolled gold tag with every stick!

Cameron Peace is a tree fruit genetics professor at Washington State University (cpeace@wsu.edu). He encourages and supports fruit breeding, especially with DNA-based diagnostic information to access genetic diversity. One such endeavor applies DNA profiling to apple tree samples submitted from across the U.S. to confirm identities and construct a single family tree.

This article was originally published in *Malus*, Issue 15, 2021 (https://www.maluszine.com). The article is reprinted here with the express permission of *Malus* and Cameron Peace.

Upcoming Conferences

March 2022 - Purdue Small Farm Conference / free to those who register (there will be a session on perennial crops – covering nuts, pawpaws, persimmon, and possibly elderberries). https://www.purdue.edu/dffs/smallfarms/sfc-2022/

July 17-20: Transitioning to a Viable World, Fifth World Congress on Agroforestry, Quebec City Convention Centre, Quebec City, QC G1R5T8 Canada. Visit website at https://agroforestry2022.org/en/about for list of speakers, registration, etc. Official language will be English.

July 24-27, 2022: Walnut Council Annual Meeting, Carbondale, Illinois.
Contact Liz Jackson (jackson@purdue.edu) or visit their website (https://walnutcouncil.org) after April for meeting details and registration. Meeting will feature field tours, multiple semi-technical sessions, and banquet with social to exchange ideas on growing hardwoods for wood and nuts.

September 16-18, 2022 - Pawpaw Festival: 24th Annual Ohio Pawpaw Festival: https://www.ohiopawpawfest.com/

Northern Nut Growers Association / In-person event is currently in the works to be held in Pennsylvania https://nutgrowing.org/

NAFEX / updates on our annual conference and zoom meetups can be found at: https://nafex.org

NAFEX Handbook

A brief review and update on availability

Kris Heeter / admin@nafexmembers.org

In 1986, NAFEX co-published a handbook for Fruit Explorers. The NAFEX Handbook was printed as a hardcopy as a 152-page book and was divided into three sections:

I. Spirit [of NAFEX]
II. Structure [of NAFEX]
III. Skills

The NAFEX Handbook is still under copyright. After exploring the joint copyright issues associated with the handbook, we have confirmed that legally we can make this available to members as a digital version at no cost. Our thanks to Chuck Wilson for thoroughly exploring this and obtaining the needed legal advice. A link to this digital copy will be sent via email in the upcoming weeks and will be made available on the NAFEX website for members.

If there is interest in having this reprinted -- or updated and reprinted – as a hard copy book, we will be happy to look into the cost. If interested, email us at the above address.

In the meantime, here is a preview for our newer members, some of the topics you will find under the Skills section and an insight to the Spirit of NAFEX:

Skills found in the handbook:

The Basic Skills of Fruit Exploration
The Living Cambium
Whip-and-Tongue Grafting
Bark Grafting
Chip Budding
Gathering and Handling Scionwood
Variety Selection and Variety Collection
Tips on Buying Rootstocks
Pear Rootstocks
Plum, Peach, and Apricot Rootstocks
The Interstem Fruit Tree
Fruit from Seed from Fruit…
Hardwood Cuttings
Hints for the Amateur Fruit Breeder
Grafting for Variety: The Splice of Life
Methods of Grafting
Cleft Grafting
Shield or T-Budding
Grafting Knives: The Experts' Edge
When to Graft
Vims: The Grafter's Bane
Apple Rootstocks
Cherry Rootstocks
Genetic Dwarfs
Modes of Rootstock Propagation
Stooling
Taking a Chance with Seed
Exploring with Books

Some of these grafting tips and info will be shared in an online Grafting Virtual Workshop coming up this spring. Watch the website and your email for details on the date and time – we'll send that out as we have it.

The Spirit of NAFEX:

The North American Fruit Explorers (NAFEX) is a network of individuals throughout the United States and Canada devoted to the discovery, cultivation, and appreciation of superior varieties of fruits and nuts.

Founded in 1967 by a small group of pomological hobbyists, NAFEX is chartered as a nonprofit corporation in the state of Illinois. Although the ranks of our membership include professional pomologists, nurserymen, and commercial orchardists, NAFEX members are all AMATEURS in the truest sense of the word — they are motivated by their LOVE of fine fruit.

NAFEX members typically work together to help each other by sharing ideas, information, experiences, and propagating material. We communicate with each other through the pages of Pomona, a quarterly journal assembled largely from articles submitted by the membership. A diverse assortment of interests and approaches are represented.

While many of us are involved in collecting and growing well-known fruit like apples and pears, others are specialists in so-called “minor” fruit such as mayhaws, kiwis, persimmons, and pawpaws. A number of members are primarily variety collectors, and some experiment to breed new cultivars. Others labor to produce good fruit crops under marginal conditions. Different, often contradictory, methods of horticulture are also advocated; organic practitioners share a forum with growers applying chemical management systems. Despite this lively divergence of focus and opinion, NAFEX members are bound together by the spirit of fellowship and cooperation in a common quest for excellence in fruit.

Interstem Grafting of Pear on Hawthorn

Richard Fahey / c/o Singing Tree, 588 Turner Rd, Oxford, NY 13830

I have been grafting fruit trees since 1968. I have about 600 varieties of fruits and nuts I’ve grafted for the purpose of finding the best varieties for my area. My purpose is to find those that are most disease and insect resistance and the most productive.

I have a special interest in hawthorn since the trees come up readily on my land. I have successfully grafted many varieties of hawthorn on the wild rootstocks as well as medlar and saskatoons.

A few years ago, I found out pears can be successfully grafted on hawthorn if a medlar interstem is used. So now my focus is on seeing how well this medlar/pear interstem combination will work.

I was into this research project for two years when NAFEX offered grants for such projects. I applied and got a grant to help the work along. Part of the obligation is obtaining the grant is to report each year on the progress of the research. To this end, I write this essay.

Major Objectives of the Research

1. The first major objective is to test to see if pear on medlar on hawthorn works in my location.
2. The second major objective is to see if the grafts will be resistant to black walnut poisoning. Hawthorn itself is resistant.

Minor Objectives

1. The research was expanded from trying European pear with medlar to include the compatibility of Asian pear with medlar.
2. Since medlar is highly fire blight resistant, I will be watching to see if it will have an influence for fire blight resistance of the pear grafts.

3. Since medlars are fairly precocious, I'll be looking to see if the pear grafts are earlier to come into fruiting;
4. I will be accessing the effect deep soils and poorly drained soils will have on the grafts.
5. And finally, I will be evaluating the effect rootstock vigor will have on the grafts.

<u>Hawthorn Sites</u>

The main site for the most of the hawthorn I am grafting was originally cleared in 1979 (42 years ago) and 30-year-old apple trees were there.

Ten years later, in 1989, I interplanted black walnut trees in this orchard, which I abandoned for a larger orchard. The walnut trees on better-drained soil have done well, while the ones on poorly drained soil have been cut down since their growth was very slow.

This site then grew up in dense brush and trees. The majority of the trees were hawthorn with breast height diameter from one inch to five inches.

I marked hawthorn trees that were spaced 20 to 25 feet away from other hawthorns and 20 to 25 feet away from black walnut trees. I picked the most vigorous trees, and sometimes left two or three at one site.

Clearing brush takes quite a bit of time since most of the brush is rose briars and thorn trees. These both can cause serious injuries if they are not carefully handled. There were, and still are, some sixty foot tall ahs trees which are being cut down and made into firewood.

Once a tree site was cleared around, I top grafted some of the trees to medlar. Other cleared around trees I cut of the tops so they would produce vigorous shoots that I could easily graft on to next year.

I counted a total of 59 sites, some of which have two or three trees in a clump. Of these 59 sites, I have grafted 35 of them so far to medlar, some in 2020 and some in 2021

Nine of the sites now have a pear grafted on to the medlar interstem. I have started by using my very best fire blight resistant pears for these nine…**Keiffer, Harrow Delight, Gem** and **Shenandoah**. I intend to use other, and also include a few pears that are more susceptible to fire blight. The Asian pears **Shinko**, **Peggy**, **Tennonsi**, and others will also be trialed for compatibility with medlar.

These are 19 sites close to black walnuts, so I will have a good number of trees to test to see how juglone poison affect the medlar and pear grafts. Because the hawthorn rootstock is not affected by juglone, it sees the grafts will not be affected, but only time will tell.

The use of hawthorn to produce hawthorn berries, medlars, saskatoons and especially pears, as "filler" trees in newly planted black walnut groves would be a great value to any grower.

<u>Costs</u>

The [NAFEX] Treasurer asked me to report my costs for this research. This is the hardest task of all for me since I am not reliant on money as many people are. I live simply in a log cabin built, burn my own wood, and grow most of my food. I have cows, goats and chickens. I don't use electricity or motors of any kind. I don't have a car. I use simple hand tools in my work. In the case of this project, my tools are a bow saw, loppers, pruners and a scythe. These tools are the best I can find and last a long time. Land taxes are my biggest annual expense at about $2,000 for 90 acres.

What if I listed the expenses as if I were working on a state or federal experimental farm for year? Well, I will give it a try!

Grating Supplies – rubber, tree kote, tape	$ 28
Tools – replacements – loppers, snath* for scythe	$ 170
Lime – powdered dolomite	$ 25
Clover seed	$ 40
Hay- for cow and goat feed converted into manure/fertilizer	$ 800
Labor – 15 hours a week at $20/hr x 40 weeks (which I don't get)	$16,000
Total, excluding taxes:	$17,083

So there is my complete report. What I would like to add is how exciting it is to take what was once the most hated plant on the homestead and turn it into a most valued rootstock!

** **Editor's note:** A snath is a handle for a scythe. This report was transcribed from a handwritten submission. Apologies in advance if any typographical errors were missed. Richard can be reached by postal mail.*

Jujube Online Resources and References of Interest

1) https://aces.nmsu.edu/jujube/index.html
Information on this website is shared by Dr. Shengrui Yao, Associate Professor and colleagues from New Mexico State University. This website includes videos, and varieties best for drying, for fresh eating, for multipurpose use, and for ornamental use.

2) https://www.nature.com/articles/s41438-020-00346-5 Liu et al. The historical and current research progress on jujube–a superfruit for the future. *Hortic Res* **7,** 119 (2020).
Note: this is a free access article and can be downloaded as a PDF.

3) Older References (courtesy of www.growables.org)

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Note from the Editor: *I made a significant editorial error in the Fall 2021 Issue of the POMONA and printed an early draft of Adam's article by mistake. This is the correct version of this fantastic article, enjoy!*

Correct Version of the Fall 2021 Article:

Mixing It Up With Apples

Adam Bigham, Kent co. Michigan
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I am sorry this is not an article about mixing things up with literal pieces of apple fruit, like for making cobbler or pie. Of course that is something we like to do as fruit explorers -- consume and enjoy the flavors! But what I'll be discussing here is the breeding of apples, as in apple trees, their DNA, and pedigrees. A central focus will be looking at the results of DNA analysis that I had performed on three varieties. Two of these I unearthed myself (not quite "I created them", like a sculpture or something a bit more apart from Nature,) and another I discovered and propagated from a volunteer tree. The analysis was done through Washington State University's Dr. Cameron Peace. I'll intersect that discussion with the traditional breeding I've been engaged in -- planting seeds and observing traits in the resulting trees.

To begin with, I'll mention that last Winter's POMONA journal had a submission from me, "Explorer-Grafters Wanted…" I sent scions to two people as a result of that article, in different parts of the United States, and there are a couple trees of this unnamed (unfruited, as yet, also,) variety in Michigan as well. My intention is to observe this tree and its fruit, and eventually name it in a collaboration. It was a seedling from the fruit of **King David** apple, and it had survived well over several years in northern Michigan. It's coded (temporary) name is **NAFEX-KD-OP2021**. The result from the DNA analysis is that it is **King David x Api**. This analysis method does not tell which parent is the seed- or pollen- parent, but in this case, having known what was the mother fruit, it can be said that **Api** is the pollen parent (hence, coming second in the parental equation shown above.)

Parents of **King David** are **Jonathan** and **Winesap** (from DNA profiling); the parentage of **Api** remains unknown. **King David** was introduced in Arkansas in 1902 -- a late season apple that hangs well after maturity, of tart, firm flesh, and resembling **Winesap** in appearance. **Api** is a very old variety, also known as **Lady** apple (Figure 1), recorded to have been in the gardens of Louis XIII in Orleans, France 1628. It is surmised that **Api** originated in the Forest of Api in Brittany. Known to be a productive, upright tree, its small, late-ripening fruit have a slightly perfumy quality. I found them very good-tasting after several weeks of storage when I had some not many years ago, whereas fresh in early October there was something weird about it, tannic perhaps.

Figure 1. **Api** or **Lady** apple; photo courtesy of USDA-GRIN

I consider **King David x Api** a fantastic cross, getting an ancient apple crossed with a somewhat more modern apple. The possibilities of getting some trait, in the tree or its fruit, that is unique and useful is increased compared with using more common varieties that are being widely grown, and **Api** certainly is a rare variety in North America to begin with. When I asked Dr. Peace if there are other offspring of **Api** in the database, he noted nine European cultivars that are children, including an interestingly named one, **Pomme d'Adam**! As well as the uniqueness of the cross, I like that there are some similar traits between the two parents, which may show up in **NAFEX-KD-OP2021**, such as a strong red overcolor, later ripening and hanging well. **King David** is noted to be a multi-purpose apple, including for hard cider, and **Api** is reputed for an assortment of uses. So this may be a tree that proves very useful indeed for fruit growers and explorers, especially as its tree health over several years was a primary factor in selecting it for further propagation.

<u>Genetic Diversity & Fire Blight Resistance</u> are my primary goals/concerns. I consider where my seeds come from, and I consider how the young trees survive/thrive where they're growing. It is possible that an apple I've given a name and sent out for further trial, later comes to prove itself susceptible to fire blight or other disease. Larry Stephenson may tell me more about that in coming years, since I've sent him a couple that are in the experimental stage, and his area has high pressure of cedar-apple rust and fire blight. **Rush McKean** for example, a seedling of **Bailey Sweet**, though I have seen its fruit over several years on the original seedling tree, is still in a trial stage -- it was the first apple I named. There

are no guarantees something wonderful in western Michigan will also be wonderful in western Oregon, for instance, or Mississippi. So, it is fruit exploring. If someone has a variety of mine and doesn't think much of it, my name's attached -- you can blame me!

Figure 2. **Randall-Wilson** apples 9/7/21, photo by author

A second tree I had DNA-profiled was **Randall-Wilson** (Figure 2). This was a "volunteer", or chance seedling tree, on the property of my friends Mr. & Mrs. Tom Randall. The property was homesteaded by her grandparents, and previously had orchards as well as other farming. There's an area that had been a pig paddock, according to her, that has numerous volunteer apple trees. I explored these trees over a couple years while visiting, and came to identify one yellow apple as having very good potential for its quality, which is appealingly tart and aromatic. I figure the trees descend from the apple varieties previously grown on the farm, and sure enough, the DNA analysis for this one reveals parents that are not uncommon heritage varieties: **Grimes Golden** and **Yellow Transparent**. Having picked apples from the original **Randall-Wilson** tree in three seasons now, I could think of it as an improvement on **Yellow Transparent**. The apples have a very nice, crunchy texture, but it will go soft if very ripe. I've seen a number of apples on the ground as I picked them (or heard them dropping,) so there is a kind of indicator when they ought to be harvested. I find them very pleasantly flavored, not too sweet so as to impede me from eating a few at a time. Once I take out the plump seeds, the core is not unpleasant to consume either -- not really bitter. It may be a precocious variety, as I had a 2nd year graft flowering in its pot.

The parental combination of this apple, as well as the other two I submitted, Dr. Peace has not come across before, and he says, "Well done for mixing it up!" (Peace 2021). When I asked him to elaborate on that I received a reply "attempting to summarize a big topic, in the hope of clearing up some common misconceptions". The major points:

> Major point 1: Few (if any) cultivars, heirloom or modern, have genetic components that aren't also present in other cultivars. (By "genetic components", I mean alleles, which are variants of genes, naturally present.) And anything unique something might have compared to other cultivars/trees will be only a small fraction of its genome.
> Major point 2: Despite its individual components being non-unique, each cultivar and seedling is a unique combination of those genetic components.
> Major point 3: However, those genetic components are inherited in a limited number of large chromosomal segments, and so they are not all mixed into billions of combinations each generation. Therefore… Cultivars and seedlings that are a combination of pairs of parents commonly present out there are a dime a dozen.
> Major point 4: There are countless parental combinations that have never been tested even once, let alone an examination of the characteristics of a family of full siblings from such pairs of parents. The basis of creative leaps is new things coming together – new combinations, appreciated in the right context.
> Major point 5: I like to encourage people to mix things up, to support transformative change. But given the fact that any given cultivar, heirloom or otherwise, doesn't have much in the way of unique alleles, the way to really mix things up is to access the various (30+) wild *Malus* species (Peace 2021).

(What is the difference between a gene and an allele?
See: https://www.britannica.com/story/whats-the-difference-between-a-gene-and-an-allele)

My approach with planting seedlings has been mostly about new things coming together. For instance, many seeds I planted came from fruit grown at orchards having 200+ apple cultivars. The chances of seedlings being from untested crosses are high, and seeds can intentionally be taken from varieties that are more rare and obscure, especially if qualities from them are potentially desirable in resulting offspring. **King David** is not especially rare, but it "has very low susceptibility to fire blight and is almost completely resistant to apple scab and cedar-apple rust. It does not sunburn in summer heat and sun" (Rom 2005). And it turns out my selected, healthy seedling **NAFEX-KD-OP2021** is possibly the only combination out there with this disease-resistant cultivar and an even rarer and interesting cultivar, **Api**.

Selecting seeds from mother cultivars grown in heirloom fruit orchards is what I've been doing. They come about by pollinator activity (bees) transferring pollen from father varieties (i.e. the pollen-parent), for these are known as open-pollinated seeds (abbreviated: o.p.). If I want to make an intentional cross between two parents, I have to delicately (clumsily, compared to bees,) transfer pollen from the pollen-parent's flowers to the stigma (top of the pistil) of the seed-parent's flowers, flag them and collect the seeds after maturity. In the near future I'd like to cross **Fall Russet** with **Rush McKean**. There are many creative possibilities: **Greensweet** crossed with **Del Cirio** is another I wish to attempt. In the context of a mother cultivar growing among diverse, quality father varieties, I place an equally important value on open-pollinated seed as I do intentional crosses.

The other seedling tree I submitted for DNA analysis is a seedling of **Fall Russet** (Figure 3). This parent cultivar became my favorite apple upon purchasing its fruit over several years from an heirloom fruit orchard. **Fall Russet** was introduced in 1875, and there are no offspring from it in Dr. Peace's database, nor of a colleague of his with whom he closely collaborates (Dr. Nick Howard, who reported the correct parentage of **Honeycrisp**; Howard et al. 2017). Besides fruit that I like being a positive trait, GRIN descriptions from the USDA collection in Geneva, New York show no occurrence of fire blight. I have named the open-pollinated seedling **Flor Bigham**. The DNA analysis confirmed **Fall Russet** as the seed parent (basically, confirming that the apples I had purchased under the name were of the same cultivar as the one in the database: sometimes identities and names get mixed up,) and the DNA profile of **Fall Russet** is that it is a grandchild of **Reinette de Hollande**. The pollen parent of **Flor Bigham** could not be identified, but it has family ties with **Newtown Pippin**, among other old cultivars (from DNA profiling). I didn't baby the original tree, and in fact some rabbits got at it two times girdling it. After the second instance I took cuttings before Spring and grafted a couple trees. I named it for my wife, so I have to take better care of it, and I think it has a lot of potential. I haven't seen its fruit yet, but probably would've by now if not for rabbits.

Figure 3. **Fall Russet** apple; photo courtesy of USDA-GRIN

<u>Horticulture is an art as well as a science</u>. For me, the primary science of apple breeding is to favor genetic diversity, and to be very wary of disease susceptibility, most especially fire blight. There is even creativity in the science of it -- selecting parent varieties for example. And the art, well, in this context it is probably most evident in the name given to a new variety. I'll let you ponder those things without further ado. The breeding of apples, then, which anyone can do, can be broken down into answering a few questions: 1) Where do your seeds come from? 2) How are the seedlings doing in your growing

environment? 3) How do you like the fruit it produces? 4) Is it worthy to be named and propagated, or to be discarded?

I have discarded trees that had grown up to the fruiting stage. At my former residence, the first three trees I planted were apple seedlings -- two from **Red Baron** (which happens to be a full sibling of **MN 1627,** one of the parents of **Honeycrisp**; Howard et al. 2017) and the one I eventually named **Rush McKean** (**Bailey Sweet** o.p.). The **Red Baron** seedlings both turned out little crab-apples. From one I propagated a clone with a root cutting, gave it to a friend as an ornamental crab (it does look nice in blossom, a fairly compact tree), then I dug both out and discarded them. So, there is a point when a tree is less than useful, and it gets discarded like a composer going to war discards his compositions he's not satisfied with (e.g. George Butterworth 1885-1916). Hopefully my craft of selecting promising seedlings has improved in recent years. Time will tell, as those that thrive will bear fruit in coming years and fulfil their worthiness of being named.

To find out how to submit leaf samples of your own seedlings or discoveries for DNA profiling, you will need to contact Dr. Peace (cpeace@wsu.edu, and he recommends you first watch his recorded webinar on the topic: https://youtu.be/bjE7Zw5YPk0). You should follow the sample collection instructions carefully. I sent my samples in April, as soon as I had sufficient, young growth on the trees I wanted to have analyzed. It took about 14 weeks from the time samples arrived there until I received the analysis results by email, and I was billed. He warns it can often take up to six months.

I am not able to offer scionwood generally at this time, but I may be able to scrounge up some **Rush McKean**, by email inquiry. That apple has a lot in common with **GingerGold**, which (I really don't know) -- could be the pollen parent? Anyway, that's what it's similar to. A good apple for early Fall, I've shared this one widely already. It is best on a productive rootstock, such as **Geneva 210**, which I've used in the past.

I have definitely been mixing it up with apples -- some mentioned here, some others in early stages of trial, with and without names. And I'm looking forward to mixing slices of apple fruit into a cobbler soon, if I can resist eating them all fresh!

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Conserving fruit and nut germplasm in the U.S. National Plant Germplasm System: foundation for our food supply

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The U.S. National Plant Germplasm System (NPGS) is a cooperative effort to promote the collection, conservation, documentation, and utilization of plant genetic resources for food and agriculture. The NPGS is managed by the Agricultural Research Service (ARS) of the U.S. Department of Agriculture (USDA). Many partners assist the NPGS in these activities, most notably land grant universities that provide infrastructural and operational support for many of the 20 genebank locations (see the NPGS map for more details). The NPGS currently curates about 600,000 active accessions representing more than 2,500 genera and 16,300 species of cultivated plants. Extensive collections of horticultural and specialty crops are a strength of the NPGS. Deciduous temperate fruit crops are curated primarily at genebanks in Corvallis, OR; Davis, CA; and Geneva, NY:

The **National Clonal Germplasm Repository at Corvallis, OR (NCGR-Corvallis**) conserves eight major fruit/nut and specialty crops and wild relatives. This genebank currently maintains 13,000 diverse accessions including hazelnuts (*Corylus*), strawberries (*Fragaria*), hop (*Humulus*), mint (*Mentha*), pear (*Pyrus*), currants/gooseberries (*Ribes*), raspberries/blackberries (*Rubus*), blueberries/cranberries (*Vaccinium*), and their relatives. The primary germplasm is maintained as trees or shrubs in orchards, as containerized plants in greenhouses, screenhouses or shadehouses, or as seeds in a freezer. Tissue cultured plants provide a secondary on-site backup where plants are disease-challenged in the field. This technique can also remove viruses, viroids, and other pathogens from plant clones. Security remote secondary backup conservation is coordinated with staff at the USDA-ARS National Laboratory for Genetic Resource Preservation (NLGRP) in Ft. Collins, CO. The diversity of the Corvallis collections is assessed through phenotypic, phenological, and DNA marker or sequence analyses. As germplasm gaps are determined, plant collecting explorations or exchange opportunities are pursued with international or domestic partners consistent with international, national, and regional rules of germplasm exchange and quarantine.

The **Plant Genetic Resources Unit (PGRU-Geneva)** in Geneva, NY maintains collections of apples (*Malus*), cold-hardy grapes (*Vitis*), and tart cherries (*Prunus*), including their wild relatives. PGRU's apple collection is one of the largest in the world, with almost 1,400 cultivars and 3,433 wild apples from 53 species. A significant portion of the collection includes wild apples that are valuable resources for scientific discoveries on the origin of apple, and as sources of new traits for modern apple breeding. The cold-hardy grape collection consists of 22 species across 1,406 accessions, with 791 accessions being hybrids. The collection provides numerous resources for grape breeders, including alternative cold-hardy scion and rootstock combinations. PGRU's tart cherry collection is small (about 100 cultivars) but provides a source of diversity to introduce broader adaptation and enhanced fruit quality to U.S. markets, which are dominated by a single cultivar. Most PGRU collections are preserved as vines or trees, with some seed collections of wild species, and backed up through NLGRP. PGRU also characterizes its collections, emphasizing fruit quality, imaging, and genetic testing.

The **National Clonal Germplasm Repository Davis (NCGR-Davis)** in Davis, CA, curates kiwifruit (*Actinidia*), persimmon (*Diospyros*), fig (*Ficus*), walnut (*Juglans*), mulberry (*Morus*), olive (*Olea*), pistachio (*Pistacia*), stone fruits (*Prunus*), pomegranate (*Punica*), and warm-climate grapes (*Vitis*). The collection contains 7,076 active accessions representing 19 genera and 214 taxa, with *Vitis* and *Prunus* accounting for more than 70% of the collection. Recent explorations in the Caucasus and

Central Asian centers of diversity have significantly enriched the cultivated and wild gene pools. The collections are maintained as approximately 35,000 live trees and vines at the Wolfskill Experimental Orchard, in Winters, CA and in containers at the nursery in Davis, CA. Tissue culture and cryogenic back-ups, created and maintained by NLGRP, are used to help secure the *Vitis, Prunus*, and *Juglans* collections. Field collections require rejuvenation, as field space permits, when they decline due to age and/or disease. The NCGR-Davis genetically characterizes accessions to determine identities, relationships among clonal accessions, and analyze genetic diversity and differentiation within and among gene pools.

Distributing germplasm, free of charge, to requestors with an appropriate justification and, as required, the necessary permits is a primary objective of the NPGS. The Germplasm Resources Information Network (GRIN) includes a publicly accessible website (GRIN-Global) to search NPGS collections, and request germplasm using a shopping cart approach. Fruit germplasm is typically distributed as vegetative parts (scionwood, cuttings, stolons, etc.), although seed, pollen, and fruit may also be available depending on the accession and time of year.

Determining the legitimacy of requests can sometimes be subjective and challenging. Our core constituents are public and private sector career research scientists and plant breeders around the world. Growers and producers may have a legitimate need for NPGS material if it is not available in trade and commerce, although our distribution quantities are not conducive to immediate large-scale production needs. We consider requests for educational purposes, but only for advanced (typically college-level) projects that require unique germplasm. The NPGS has experienced a steady increase during the pandemic in requests for material from those interested in home, personal, and community gardening, very basic plant educational and science projects (E.g., home schooling), and other well-intentioned but not scientifically rigorous citizen science. We applaud all these endeavors, but it is beyond the scope and resource limitations of the NPGS to provide free germplasm to support them. The problem has been exacerbated by numerous online sites and blogs that tout "free seeds from the government," some of which even coach readers on how to try to game the system.

Requests for germplasm from members of serious hobbyist and specialty growing organizations can be especially challenging to evaluate. We recognize that such organizations are frequently partners in conserving and making available unique germplasm, especially for heritage or heirloom cultivars where the NPGS cannot curate all of them. The recent emphasis on NPGS acquisitions has been on genetic stocks, and crop wild relatives and other minimally domesticated germplasm to enhance the genetic pool needed to address numerous current and future crop production and protection challenges.
Members of organizations such as California Rare Fruit Growers (CRFG) and North American Fruit Explorers (NAFEX) are generally knowledgeable, passionate colleagues, and advocates for the NPGS. We always carefully consider requests for germplasm from your members and would like to fulfill them as often as possible.

The NPGS and its deciduous temperate fruit collections curatorial staff want to offer some guidance and suggestions that will help us evaluate and manage requests from your organizations:

- Before requesting material from the NPGS that may be available from other sources, consider soliciting fellow organizational members and arranging budwood and other propagule exchanges.
- Carefully consider your objectives and justification before requesting material. Many of you are intrigued by collecting and growing a new plant/cultivar. We NPGS curators obviously share that passion with you! But ensure your intrigue represents a "need," and not just a "want". Also, provide a succinct but thorough justification for your request in the GRIN shopping cart checkout process. We receive many requests with very little narrative justification (E.g., just a couple of

words, such as "plant breeding"), and plan to better instruct the importance of more adequately completing this field in GRIN.

- The GRIN curatorial software shows NPGS staff past order history and outcomes of requests. We anticipate using more machine learning approaches in the future to identify excessive (admittedly subjective) requests in number of accessions and total number of orders, and repeatedly requesting the same accessions. We recognize that frequent or repeated requests are not necessarily indicative of abusing the system, but we are likely to ask for increasingly rigorous justifications for them.
- The GRIN order profile includes a required field for the requestors' organizational affiliation, although we recognize that not every legitimate requestor (E.g., an independent plant breeder) is part of an organization. CRFG and NAFEX members can rightfully complete this field in their profile; however, that alone is not adequate justification for a request. The factors discussed above are also important considerations. We suspect we have seen a few cases of "name dropping," i.e. where people falsely claim affiliation with your organizations to try to obtain material. Although it is a major project, you might consider the approach one of our seed-oriented partner organizations has taken. Seed Savers Exchange maintains an in-house database of their members, their crop specialties, and availability to share material. Seed Savers Exchange members often include a link to their profile in the justification comments when making requests to the NPGS. This helps us validate them as a legitimate member of the organization.
- Lastly, consider whether a single member could collect and aggregate yearly requests to the NPGS, especially for material shipped as dormant scionwood, serve as the point of contact for receipt of the order, and then distribute the items we provide to the appropriate individuals within the organization. We realize this may not be practical for geographically dispersed organizations, but some have local or regional chapters where this may be possible. Such would help the NPGS maintain efficient workflows and manage costs during the dormant shipping season. We also appreciate receiving a requestor-provided account for shipping charges, although we do not require it.

In summary, our deciduous fruit crop genebanks appreciate the support and advocacy provided by specialty growing organizations such as yours. We will consider requests for germplasm from your members based on merit, and ask you to consider the recommendations we have provided. NPGS germplasm is a valuable resource whose inventories are not limitless, especially for many crops that are typically clonally propagated. We have experienced a steady increase in demand for material over the past decade, with many requests that are beyond our mission to fulfill. By working together, we can ensure these valuable resources are conserved and distributed to benefit maximally global food and agricultural production. The scientists in the NPGS system appreciate the knowledge and support CRFG and NAFEX members provide, and look forward to continue sharing information and germplasm as we "preserve genetic diversity for all people for all time."

Seasons of the Nursery Business

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I don't think I'd particularly recommend the nursery business to anyone (that I like). The work is hard. You'll stay dirty and wet most of the time. The work is year-round, while the profits are seasonal. Just like raising livestock, you can't really leave things to tend to themselves for very long. There's not really an ‘off season,’ or ‘lay-by time’ like in traditional agriculture. There are no limits to customers’ demands. Immediate and fast profits, forget them; since you’re growing PLANTS for sale, it takes some time, usually six months or more, between starting them and getting them to market. The business requires serious PLANNING, no kidding, you’ll be forced to make at least a one-year plan, minimum, and stick to it, which is hard, HARD for a small business; what you’re propagating now is intended for sale six months from now, or even a year. I’ll tell anyone, it ain’t what you can GROW, it’s what you can SELL, that really matters; you gotta make enough profits to make this worth your time, if you want to continue. Organization is key, you’ll fail without it. Accounting is important. I don’t think this business is high-profit enough to invest a lot into infrastructure, to start off.

So…if you think the nursery business is your path to fame and fortune and riches…I doubt it. Still…if you really love this kind of work and find dissatisfaction with all other forms of labor…maybe. I’ll say, at the end of every day of hard and dirty labor, I do feel a measure of satisfaction and contentment. I’ve DONE something, something important, my work is significant and worthwhile, and my trees are something that will hopefully outlive me. It sure beats just passing time in a pointless factory job.

This is written in January 2022, after almost two years into the covid pandemic. Nothing’s NORMAL now, and when will it be, again? I can say, the pandemic and the supply chain problems have created a new interest in food security, even in those of us who are prosperous - people now understand the importance of growing at least some of their own food. Seed companies, fruit tree nurseries, small farming tools – have all SOLD OUT during the last year. People WANT fruit trees now, and if you have them, they’ll sell for a good price. Now’s our time!

Here’s my ‘schedule’ of tasks throughout the year:

JANUARY – January is busy! Never mind that it’s the coldest month; I have to hustle, inside and out! I envy the corn and cotton farmers who can watch football games from their cozy couches.

In Mississippi, the heat prevents me from shipping trees in boxes much of the year; I can only ship in the cooler months. January is cool and my trees are dormant, so this is the prime time to ship. I dislike shipping; it’s a huge time-suck, and I question how profitable it is, but if you advertise on social media, as I do, you kinda gotta do it. Customers all over the country will see your Facebook posts, and they’ll WANT what you offer, and willing to pay exorbitant prices for shipping a rare variety. Taking orders, keeping them and your accounts straight, invoices and shipping labels, locating the right trees and packing…it keeps me and my crew busy.

Trees in January should be at the height of dormancy, so that means PRUNING is done now. My established orchard has gotten rather extensive, so pruning is a project that takes a couple of weeks. I gotta do it, before they bud out in an early spring. No matter the weather, in January, this means climbing trees and working from a tall ladder, on muddy ground, with Arctic blasts of wind whistling about my ears, not so much fun.

I dormant prune to control size and increase fruit production, but also…my older trees are a harvestable CROP for me, of scionwood. I do a fair business in selling scions to collectors and nurserymen; I’ll do some trading with fellow enthusiasts, and I’ll buy some. So, as I prune, I’m also picking out the best scionwood, bundling it up, labeling it. In the evenings I’ll cut it into proper lengths to fit in a one-gallon plastic bag, and usually seal the cut ends with wax. Scion orders start coming in now, I’ll fill and mail them. The work with scions is easy, what you’d like to do when the weather is bad outside. It can be a bit tedious; a customer wants two of this, three of that…which, means picking through a refrigerator full of bags, hundreds of varieties, selecting the right ones, labeling them carefully, and mailing…good inside wintertime work.

And, January means a lot of repotting. As I graft in spring, I pot about two thirds of my trees. The rest, I plant in my nursery beds, in the ground. Now's the time to dig these trees and pot them. These will be my spring inventory, and I'll hope the roots will grow to fill the pots by April, when I'll sell them. Potting means that you need to have the plastic pots and potting soil on hand; those should have been already settled, and the labels, too. I don't mind working in mud and water, but potting soil in January is COLD, it's a lot of bending and stooping and kneeling…my hands stay chapped and cracked in January, my clothes stay damp, I stay chilled, and there's no help for it. January is a hard month, physically.

FEBRUARY – A continuation of January, mostly. Pruning HAS to get done by now. I HAVE to get those bedded trees dug and potted, to make room for the next bunch. More shipping of trees and scion orders. You need to have your materials ordered or arranged already, your rootstock, pots, potting soil, grafting materials, everything you'll need for grafting season, which is coming up NEXT MONTH. In Mississippi, you'll see a few native trees wanting to bud out, so you know you need to get all your winter work out of the way; GRAFTING SEASON is coming!

MARCH - GRAFTING SEASON is here! Well, in Mississippi, inside my warm high tunnel, I'll start. I schedule my rootstock orders to arrive the first or second week of March, and I'll start grafting right away. If your grafted plants will be outside, or you live Up North, early April will be better.

Grafting's no great chore, if you're doing only a few; actually, kind of fun. I plan on grafting a few thousands, so I feel a little pressure to get 'er done. What I'm doing now determines my income for the year. When my rootstock arrives, I immediately heel in the bundles into big tubs of damp sand, outside. In Mississippi, those won't freeze solid, and they'll be fine in there for some time, even leaf out and start rooting. I can select out a handful at a time for grafting.

I'm not FAST. It's my habit to graft a dozen at a time, the same variety, and pot or plant those immediately. Yeah, that's what slows me down; a hundred a day is a fair rate for me, but I'm FINISHED with those for now, just waiting for them to heal and grow. Wet potting soil in March is cold; I'm getting tired of my hands being chapped and red and raw. I go to bed tired and sore in March and sleep hard. Daylight to dusk, every day in March. Still shipping boxes.

APRIL – Graft, graft, graft, pot, pot, pot. Can't take a break, this is GO TIME in the nursery business; this is your year's income, right here. Can't get sick or hurt. Hustle from can't see till can't see. Take those dormant fig cuttings from the fridge, root 'em, figs will be your first marketable products for this year. Plant any seeds you have.

There's lots of stuff in April to distract you from your important propagating. Farmers markets are starting again, gardening events, selling venues that you NEED to attend; after all, that's your ultimate goal, to SELL these plants. Fall and winter planting are best in my climate – customers don't care, in SPRING, when they can go out in their yards in shorts and work, that's when they want to give you money for plants. You've GOT to be prepared for your spring sales; they're the most lucrative. What's left from last year, that's your spring inventory. Hopefully you've planned for it? The trees you're grafting now, those won't be ready until late summer…see what I mean about long-term planning? April's a busy selling month.

Another distraction – grafting classes, and lectures. I usually volunteer for a few every year, and April is the time. Yeah, you're terribly busy with your OWN grafting; you've GOT to get it done, you may begrudge your time…find the time, anyway. It's important.

Teaching classes and lecturing is NOT a waste of your time!!! If you're a NAFEX member…it's part of our Prime Directive, you know, NAFEX is an educational organization; it's our long-term mission to educate the public, tweak their interest, gather new members…GRAFTING is the topic newbies are most interested in; the sexiest, hottest topic. So, teach them. Remember, the Next Generation of NAFEX leadership is who you'll be encouraging. And…anytime you're in public like this, at sales or lecturing, you're ADVERTISING, promoting yourself and your business, and that's critical. You are literally creating your own customer base; every person you come in contact with is a potential customer.

April is tiring; you've got to keep up your enthusiasm, as you engage with a LOT of people, and you're probably physically and emotionally at your limits. Keep going and push through, your income and business depend on it. I spend a couple of hours each day engaging with customers, dispensing free advice, and that comes to a peak in April, on top of everything else. Settle your mind; this is a part of it. Hey, at least you're making money at sales right now.

Oh yeah, April is also tax time. Now you'll understand why it's important to keep records and accounting.

MAY – Finishing most shipping. Lots of selling events; you should be making good income right now, and that's SO encouraging! Grafts should be taking by now; pluck off any blossoms from newly-grafted trees. You'll start some watering and tending now, the REAL nursery work. Still grafting some, but finishing up now, hopefully, so some pressure is off. Most years I'm grafting a few into June, which is perfectly OK. Sales should put you in a cheerful mood.

JUNE – Sales should still be good. Farmers markets should be getting crowds of customers; some of them will want fruit trees. Customers don't understand how bad they NEED heirloom and exotic fruit trees; you have to explain it to them, but most get that message real fast; it makes sense, and they will buy from you. You'll do a lot of talking. The serious watering will start in June; this is the time you'll start regarding irrigation systems.

JULY – It's starting to get HOT in Mississippi. Water plants. If you have trees with several feet of growth, consider topping them, to inspire branching. Sales are still good, even though I don't particularly recommend planting now. Your rooted figs should be big enough to sell now, and you'll find a surprising demand. Citrus, exotics, cold-sensitive plants, berries, all those are good money-makers. You need to be forming plans for next year's production NOW.

AUGUST – It's freaking HOT in Mississippi now. Water, full time. August in MS is something we SURVIVE, not enjoy. If you're working in a high tunnel, and your hands start trembling and your thoughts become disjointed, LEAVE; drink some water in the shade. I am still making sales, even though I can't honestly recommend planting now. Go ahead and order rootstocks now, if you haven't already. The big rootstock nurseries DO sell out of the most popular types and sizes.

SEPTEMBER – Water trees. It's STILL hot, though the nights cool down some. People are starting to make fall planting plans, so sales are OK-ish. Make your plans for next year. If you make and use much compost, now's a good time to begin your winter piles.

OCTOBER – Still hot, but glorious coolness in evenings and at night! Do some MORE watering. Fall sales are starting to seriously ramp up now, so push those trees, make some money.

NOVEMBER – Fall sales, not as great as in the spring, but pretty good! Get out there and SELL! I can honestly recommend planting now. November sales are what you need to take you through the winter; you'll need those profits. Less water evaporation with cooler temps, so tending and watering is minimal. If you need to winterize anything, start. Order pots, finalize next year's plans. Enjoy your profits.

Selling events – well, they're a THING. They're never CASUAL, but carefully and deliberately planned. If you grow out a random bunch of cool plants, hoping to sell them to casual passers-by – you're in for a disappointment. Most everything I do is deliberate; I'm growing a particular group of trees, TARGETING a particular bunch of customers; I'll show up at a particular event at a certain time, and have exactly what they'll want. No kidding; I really do, and you need to also. I refine my plans every year, and sales grow and grow and grow. BECAUSE, it's the MARKETING, not really the growing out, that will make or break you, in this BUSINESS. It's the same as any small business, failure means no income. Stuff gets serious when these trees are your only source of income. Most small businesses fail within the first couple of years. PLANNING is by far the most important part of the nursery business.

DECEMBER – Sell, sell, sell. Start shipping boxes. What you don't sell now you'll have to keep yourself all winter. You want these trees OUT of your hands, and into a customer's. Start counting your year's profits. You may be pleasantly surprised. Or not. You'll begin to understand the difference between GROSS SALES and NET PROFITS, you surely will. Try to be encouraged by your successes; note your failures, and try to correct them for next year. Get some rest during the holidays, because January is coming.

NAFEX Claypool-Lehman Research Fund

This research fund (originally called the NAFEX Claypool Research Fund) was initially established in 2018 in memory of James Claypool. The first grant recipient was Adam Bigham. Adam's project has focused on pear and apple breeding. Adam has been providing updates each year in the POMONA.

This year, the NAFEX board agreed to change the name of the fund to the "Claypool-Lehman Research Fund" in honor and memory of both James Claypool and Jerry Lehman. Upon his death in 2019, Jerry's estate made a donation to NAFEX which the board has directed towards the research fund.
If you're new to NAFEX and not familiar with work done by James and Jerry, below is a bit of history. You can find more about their work and contributions through the NAFEX POMONA online archives as well as through the INFGA (Indiana Nut and Fruit Growers Association) archives available its members.

James Claypool (1918 – 2010) [edited/revised from a previously published POMONA]

James Claypool was born in 1918 and was the worlds' most prolific breeder of the American Persimmon. Jim was a World War II Naval flight instructor and later flew four-engine transport planes in the South Pacific, carrying wounded soldiers and medical supplies. After the war he became a businessman in the oil industry in St. Elmo Illinois.

James believed that greatly improved varieties of the American persimmon, a popular fruit in the Midwest, could be bred with a few simple crosses and commercialization could begin. All of the named varieties had been collected from the wild and were considered the best in a given area where they were found. Universities are only interested in fruits of established commercial value and breeding the American persimmon was never undertaken. James collected all the named varieties that he could find and grafted onto trees around his sales office. Once established, he started crossing them & keeping good records of the pollen & seed parents for a "family tree" of each seed produced.

Jim laid out 12 rows 1 1/4 mile long & placed the rows on 15-foot centers, 10 feet spacing between trees. After a number of years and 900 trees later he still hadn't developed the commercial persimmon he was looking for and continued breeding reducing the spacing to 5 foot between trees. Those that didn't measure up to his goals were excised, grafted to known cultivars or replaced by later seed which Jim had continued to breed. The total number of trees he bred was 2400 which is a phenomenal task.

He kept meticulous records of his tree's fruiting characteristics spending hundreds of hours checking each tree every few days, spending nearly every day in the orchard during harvest season. He gave access to the orchard to friends, neighbors and asked for help to evaluate. He freely made scion wood available to anyone who wanted it.

Around 1991 Jim became seriously ill and was diagnosed with Lou Gehrig's disease. He tried desperately to get help from universities & other organizations to carry on his program, but none came forth. Later it was discovered it was a misdiagnosis rather had heart problems and he continued his breeding work. In his late 80s he was forced to give up his research and working in his persimmon orchard when his walking became unstable and could no longer walk through the mile and 1/4 long orchard.

The family continues to grant free access of the orchard to Indiana Nut and Fruit Growers Association members to continue breeding, evaluation and scion wood collection. Much of his material is now being propagated in Canada, Japan, Russia, Ukraine, and many European Countries. Many breeders are using his material for further breeding as well as hybridizing with the Asian persimmon.

In 2003 he was awarded the coveted NAFEX Milo Gibson award for his accomplishments in improving the American persimmon. We was no longer able to attend the annual meetings therefore was surprised when it was fittingly presented to him in the persimmon orchard. He wrote 10 articles for Pomona regarding the American persimmon with his final article a letter thanking NAFEX for the beautiful hand made walnut fruit plate.

The world will forever benefit from the persimmon collecting and breeding work he began.

Jerry Lehman (1936 – 2019) [edited/revised by Kris Heeter from the Spring 2019 Hoosier Kernel / INFGA]

Back in the early '70s, Jerry was encouraged to join INGA (now INFGA) by his brother-in-law, Dr. Charles Spurgeon. Jerry didn't have any real experience with the wild fruits of Indiana but apparently Charles and the INGA lit a fire in him that carried him into the amazing hobby that he so dearly loved.

Jerry became an extremely active member of both INGA/INFGA, NAFEX and NNGA, hosting several meetings as well as a persimmon conference and Claypool evaluation trips. He, along with Cliff England and Don Compton, carried on and expanded upon Claypool's work. He was a wonderful person, passionate and energetic, a great leader and teacher. He was always cheerful. Simply put, he loved what he did and it was apparent to those around him.

Jerry was a world traveler seeking and spreading knowledge about fruit growing. He became regarded as the foremost authority on anything persimmon and almost as well known for his efforts with pawpaw development. Jerry won many of the highest awards for his entries at the pawpaw festival at Lake Snowden. He also made inroads into commercializing persimmon – following the vision of James Claypool. In 2018 he sold 9,500 pounds to a processor and had aspirations to produce much more in the coming years. He is greatly missed and will be for generations to come.

NAFEX Claypool-Lehman Research Fund - Call for Proposals

Got an idea you think would improve fruit growing practices that you want to test? On the way to developing a new cultivar or fruit crop, but would like a little boost? Send in your idea!
NAFEX has created the James A. Claypool- Jerry Lehman Research Fund and would like to help!

Open to all NAFEX members

Submission deadline: April 1, 2022
Send your submission via email to nafexresearchfund@gmail.com or via snail mail to: Charles Wilson, 1375 Willow Branch Rd., Jacksonville, IL 62650

We are pleased to announce that NAFEX's Claypool-Lehman Research Fund continues to have funds available to sponsor a limited amount of pomological research. The purpose of this fund is to support small-scale experiments in areas of fruit research that, while valuable to the fruit-growing public, are not likely to be funded by government agencies or private agribusiness corporations. It is a niche where NAFEX can have a significant impact per dollar. **There is currently about $3,000 in total available funds**. Depending on the quality of submissions, the Research Grant Committee may fund multiple smaller proposals, or one larger proposal. Feel free to submit a more expensive proposal with the understanding that, although NAFEX won't be able to fully fund it, we might be able to help point you to other sources of funding. **We anticipate that awards will be made in the summer or fall of 2022.**

How does it work from an applicant's standpoint?

1. Applicants will send their research plan along with an itemized list of what they intend to purchase with grant funds to the committee by the submission date. Our tax status does not permit us to fund travel, books, or tuition.

- Please don't let the words "research plan" discourage you. We are most interested in ideas. Polished USDA-ready tomes are not needed. The RGC will help you with the research plan to give it the best chance of yielding the most information for the resources available. Email, and the use of standard file formats such as .pdf and .doc or .docx will speed the communications.

- A friendly Application Organizer Worksheet to help you present the plan is at the end of this article. The application should be brief. Half-page initial sketches are fine. Applications with more than 10 pages of text description may be sent back without review. Pictures and drawings are welcome and won't count against the 10-page limit.

2. The RGC will acknowledge receipt of the application and subsequently send suggestions to the applicant. At this point in the process, it's a back and forth discussion between the applicant and the RGC.

3. After the submission deadline, the RGC will evaluate the proposals for merit and potential impact, decide on how the funds will be distributed, and notify all applicants of the decision. A brief notice will be posted in Pomona with the proposal title, purpose of the experiments and the awardee's name. In cases where the applicant is concerned about patent protection or some other legitimate reason, they may stipulate that the RGC temporarily withhold the proposal's purpose until their report is published.

4. The awardee will then receive a check and get going on his/her experiments.

5. The awardee will have to agree to a few conditions which shouldn't be a problem for NAFEXers:

a) The awardee must (minimally) publish their results in the Pomona. Any other publications are also encouraged. Any publication of results must be accompanied by a stock statement acknowledging that the work was, in part, funded by the Claypool Research Fund, which is administered by the North American Fruit Explorers (NAFEX). Sharing information is what NAFEX is all about anyway. In addition, NAFEX's mandate as far as the IRS is concerned is public education.
b) For multi-year experiments, the awardee must also submit a brief annual report. It need not be burdensome and can be quite simple. The nature of the report would depend on the specific test.
c) If new cultivars are being developed, the awardee must make germplasm developed by them with the aid of NAFEX funding available to the public at a reasonable cost. They may charge for it or patent it, but the awardee cannot ask a prohibitive price for their material, and people requesting material should have a reasonable expectation of receiving it. It is up to the awardee whether to personally handle germplasm requests or have a nursery or germplasm repository handle the requests.

Sharing knowledge and material are basically what conscientious NAFEXers do anyway, so it shouldn't add any hassle. However, as a stick to go with the carrot, applicants will not be eligible for further NAFEX funding if these agreements are broken.

The NAFEX Research Grant Committee needs members! C'mon! It'll be fun! Taylor Malone and Chuck Wilson are currently serving on the committee, but more people would be helpful. We're aiming for five members. NAFEX RGC committee members and their families are not eligible to receive Claypool Research awards as long as they are in those positions. If you are interested in serving on the RGC, send a note to nafexresearchfund@gmail.com

How will it work to serve on the RGC?

1. The Research Grant Committee will send out a call for proposals briefly explaining the ground rules and setting the deadlines for submission and review.

2. After the submission deadline, the RGC chair will notify all applicants of receipt of their application and then the RGC will do an initial pass of evaluating the submissions and put them into three initial bins:

a) Submissions for which the RGC has no suggestions or questions (probably rare)
b) Those that get feedback, or request for clarification from submitter (most, we expect)
c) Inappropriate (also likely to be rare, we hope).

3. After the submission date the RBC will review the submission. The RGC reserves the right to consult experts inside or outside NAFEX for specialty evaluations, unless the submitter specifies that they want it to be confidential and restricted to the RGC until the time of publication.

4. Each RGC member will rank the submissions and return their comments and rankings to the chair for compilation. At this stage, cost will not be a consideration—just merit and potential impact.

5. The RGC will discuss the proposals. Afterwards each RGC member will indicate that their rankings are final. If necessary, the chair will break any ties in ranks, but otherwise will have only a single vote and will faithfully compile the ranked application scores and communicate this back to the RGC.

6. The RGC will then decide through back and forth communications how to balance the award funds available with the depth of funding. (This is the least fun and hardest part in my opinion, but is important). In other words, if a hypothetical grant is excellent, but would soak all the research funds, do we just fund that one or fund the top three to a lesser extent? It will be a case-by-case decision. Ideally, the RGC will do it's best to help great ideas that are too expensive for us to fund get funded through other sources. The role of the RGC in cases like this is to point those applicants to deeper pockets.

7. The RGC chair will then notify all applicants of the RGC decision and arrange for a check to be sent to the awardees.

8. The RGC chair will send reminder communications to awardees to aid in getting the results of the experiments into the POMONA.

The RGC members need not get together geographically. Though it's always preferable to have discussions face-to-face, for a low-budget international organization like NAFEX, that's not practical. Email and phone communications will be preferred, but we will accommodate people who are interested in serving on the Spring-Summer 2019 RGC but are limited to snail mail communication.

Visit NAFEX.org to find out more about the grant: https://nafex.org/index.php/members/nafex-claypool-research-fund/

Visit NAFEX.org for the Application Organizer Worksheet: https://nafex.org/wp-content/uploads/2019/03/CRF-CFP-Application-Organizer-Worksheet.pdf

All Things NAFEX

Contact us at our new email address: admin@nafexmembers.org

NAFEX Members' Exchange: Seeds, Scions, Etc.

Regarding our Exchange Page: In these days of fast communication, we urge NAFEX members to check our Facebook page for many of your scion wood offers or searches. NAFEX members are still invited to exchange scions, seeds, cuttings, supplies, and study materials. These ads are accepted as a service to our members for free, but NAFEX accepts no responsibility for the authenticity of information given. Most material is to be given for free or swapped, however, reasonable postage or a small fee may be requested by the advertiser.

Fruit & Nut Interest and Regional Fruit Groups

This list is our most up-to-date but still a work in progress

Fruit and Nut Interest Groups

Apple: Derek Mills, Hocking Hills Orchard, 14435 Nickel Plate Road, Logan, OH 43138
Apricot: Bob Purvis, 1568 Hill Road, Homedale, ID 83628-3517 / (208)-407-6781
Canadian Sources: David Maxwell / David.Maxwell@Dal.Ca
Edible Dogwood: Cornus mas, Cornus officionalis, Cornus Kousa Chair: John Holzwart, (920)457-9290 .
Fruit Trees for Public Spaces: Bill Whipple / whipplebill@hotmail.com
Grapes — Patrik Schumann, PO Box 40171, ABQ, NM 87196. (NM, CA, NY plantings)
info@alumias.net
Hawthorn - Richard Fahay - Singing Tree. 588 Turner Rd, Oxford NY 13830
Honeylocust (Gleditsia triacanthos): Andy Wilson, Springtree Agroforestry Project, 268 Springtree Lane, Scottsville, VA 24590 (434) 286- 3466 (evenings are best)
pvcc.edu/faculty/awilson/agroforestry
Pawpaw: Barbara Rosholdt / rosholdt@erols.com
Pear:
NORTHERN —David Sliwa, 2682 Lannon Hill Rd., Decorah, IA 52101. (563) 382-3922 / ddsliwa@gmail.com
Persimmon:
AMERICAN: Taylor Yowell / thegardenfarmacy@gmail.com
Quince: Joseph Postman / 35768 Blakesley Creek Rd., Philomath OR 97379 / 541-609-0241 / joseph@casco.net
Walnut: (Black) Richard Fahay - Singing Tree. 588 Turner Rd, Oxford NY 13830

Regional Interest Groups

Although NAFEX does not have regional or state chapters, we do encourage the development of local groups that have the same interests and goals. Here are some current groups:

Alaska Pioneer Fruit Growers Association - https://www.apfga.org
Midwest Fruit Explorers (MidFEx): Chicago area active fruit growers. http://www.midfex.org
Southern Fruit Fellowship (SFF): Covers the southeastern states –
https://www.facebook.com/groups/SouthernFruitFellowship/
Backyard Fruit Growers: Pennsylvania Group - https://www.facebook.com/BackyardFruitGrowers
Indiana Nut and Fruit Growers Association (formerly INGA) www.infga.org
California Rare Fruit Growers - https://crfg.org
Holistic Orchard Network - http://www.groworganicapples.com
Western Cascade Fruit Society - https://wcfs.org
Seattle Tree Fruit Society - https://www.seattletreefruitsociety.com
Michigan Nut and Fruit Growers Association - https://michigannut.org
Northern Nutgrowers Association - https://nutgrowing.org

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