The Leaflet

Central Coast Chapter CRFG
December 2020 Newsletter
by CRFG CC Chapter Members

Happy Holidays, CRFGers!

These pictures from our newsletters in years past reminded me of how much I miss seeing all of you. I hope they will bring back fond memories for you, too.

Great News!!! We are having a January meeting!
This will be a Zoom meeting, and all are invited to attend.

Zoom Meeting Notice

Where: At home on your computer or other electronic device.

When: Saturday, January 9, 1:00 - 3:00 pm
The first 30 minutes will be for people to log on and talk to each other. The official business meeting will begin at 1:30.

Program: 2021 elections, reports from board members, new business and general comments, other topics TBD.
See the website: www.crfg-central.org/calendar for more current information as it becomes available.

Zoom Invitation:
Art DeKleine is inviting you to a scheduled Zoom meeting.
Topic: CCC CRFG January 2021
Time: Jan 9, 2021 01:00 PM Pacific Time (US and Canada)

Never Used Zoom Before?
Detailed login instructions will be available on the website closer to the date of the event.
Also, Art will be available the hour before the start of the meeting to help you with any issues you may have. His cell phone number is 805-801-9874.

How To Join:

To Join Zoom Meeting by Computer, Tablet, or Smartphone:

1. If you have never used Zoom before, download the Zoom software on your computer, or the Zoom app on your smartphone or tablet. More specific instructions will be available on the website closer to the date of the event.

2. Click on the link below at the appropriate time:
   https://calpoly.zoom.us/j/87531420583

3. Enter this Meeting ID: **875 3142 0583**

Or...

To Join Zoom Meeting by Landline or Flip-phone:

1. Call 1 669 900 6833

2. Enter this Meeting ID: **875 3142 0583**

Zoom Meeting Rules

1. If you have extraneous noise at your home, please mute yourself.

2. During the business portion of the meeting, all participants (with the exception of the presenters) will be muted.

3. When muted, please view in SPEAKER MODE.

4. When muted, please use the "questions" and "chat" feature to ask questions.

5. If you have technical issues, please let us know in "chat".

Election for 2021 Chapter Officers and Board Members From Larry Hollis

Traditionally our chapter holds our annual elections at the December meeting. This year has been anything but traditional with all but a couple of 2020 meetings cancelled due to Covid-19.

Now that vaccines are becoming available, we hope to resume meetings in the not-too-distant future. We also hope our current officers and committee members will agree to stay on in 2021. If you are an officer or committee member and can no longer serve, please notify Larry Hollis at l_hollis@hotmail.com and we will fill your position. Also, if you would like to do more for the chapter by serving on a committee or as an officer please let the nominating committee know by notifying Larry. We plan to hold elections during our upcoming January Zoom meeting.

Thank you, Drina Burns

Drina answered our November newsletter plea for 5, 10, 15, and 20 gallon pots. She donated over 40 pots!

To top it off, she also allowed us to cut passionfruit cuttings from her 3 vines. We'll root them and plant them against the orchard fence in the spring.

Myron's 2020 Ugly Fruit

Folks have been curious to see what Myron's 2020 ugly lemon looks like. Myron sent this picture for the curious.

Demonstration Orchard's First Dragon Fruit
By Jesse Englert

I'm sure we all can agree that 2020 has been, in many respects, a complete disaster of a year. During the many lockdowns since March, I have called upon the demonstration orchard almost weekly to provide a safe space to be outdoors. A place in nature where my two children can work and play, well, mostly play, while I do maintenance work. After being cooped up at home on a computer all day for work, it is a relief to have a place to go to do some volunteer hard labor. To see the literal fruits of those labors has been a source of great joy for my family during this dark year.

Right before harvesting on Dec 19

Weighing in at 135g

I'm thrilled to report the Demonstration Orchard produced its first dragon fruit! A highlight of 2020 in my book. Back in early October I noticed a few flowers were blooming and notified Joe Sabol who pollinated them on October 2nd. One of them succeeded and was harvested on December 19th. It was fairly small but enough to divide into 4 pieces for my family to sample. It was beautiful and delicious!

A big thank you to Joe for doing the pollination and two more big thank yous to my co-orchard managers Dara and Manny for all the hard work they've put into maintaining the demonstration orchard during the pandemic. We're looking forward to 2021 when hopefully we can host work parties again at the orchard. Wishing all CFRG members a very Happy Holidays and here's to more dragon fruit in 2021.

My daughter Maggie enjoying the dragon fruit

Beautiful bright pink flesh

Robert and Carol Scott's Garden (The Positive Covid Report)
by Carol and Robert Scott
Photos by Larry Hollis

As usual we have kept ourselves busy on our property. This year, without a vacation, we were able to see a full year of fruit and veggie production.

Che (cudrania tricuspidata) also known as Chinese Mulberry, Mandarin Melon

Carol's latest mosaic

Medlar (mespilus germanica), a garden favorite for centuries in Europe, when ripe (bleated) flavor is cinnamon applesauce.

Close up of Medlar fruit

Paw Paw (asimina triloba). Largest native fruit to the US we have 6 varieties

Cherry of the Rio Grande (Eugenia aggregate), native to Brazil, cherry like flavor.This is our 2nd crop this year, very productive 1st crop, made good jam and excellent out-of-hand eating.

Close up of Cherries of the Rio Grande

We had a 4 trunked giant eucalyptus tree (43 years old from seed) removed by PG&E, and planted our best vegetable garden ever. We grew copious amounts of cucumbers, squash, eggplants, peppers and melons. It is the only place on our property with full sun all summer.

We also enjoyed a bountiful crop of apricots (pixie), peaches (Chapman), and of course many varieties of plums, pluots, apples, pears, asian pears and sapotes.

Robert's BBQ

Robert kept busy grafting sapote and cherimoya, moving 50+ varieties of white sapote, and 30 of cherimoya to seedling trees, making over 300 grafts. He also spent his free time (?) building a BBQ. Carol kept busy, weeding, watering, harvesting, drying, pickling and giving away squash and cukes. We both added a few new art projects to our yard.

We are very lucky to have this piece of property to spend our time and grow most of our food.

Stay safe.

Pawpaws: Former Mastodon Snack Gains in Popularity
by Tom Sheldon

A few months ago, Jenny and I were touring Robert and Carol's spectacular garden and orchard. Robert showed us his pawpaw trees. Knowing I was from Indiana, he mentioned that they were pretty common and indigenous to the state. That got me curious. I had never heard of pawpaws and when he said they tasted like cherimoyas, I was even more intrigued. How did I grow up in the midst of such a tasty fruit and not know about it or even hear about? I blame it on supermarkets. People have learned to get their fruit from stores and ignore what's right out there in the wild, or at least growing on a neighbor's tree.

I started doing some research. I read that in 1916, agricultural experts voted the pawpaw the most likely fruit to succeed in America, ahead of blueberries and cranberries. Dara sent me an article from the Nov/Dec issue of CRFG's *Fruit Gardener* with the title "Neal Peterson and his Pawpaws". It describes pawpaws as America's forgotten fruit and that is certainly the case in my hometown where local peaches are the reigning fruit. If you are interested in growing pawpaws, refer to the CRFG article.

In the book "Pawpaw: In Search of America's Forgotten Fruit" by Andrew Moore, pawpaws are described as a very ancient plant that emerged during warmer periods of Earth's history. When things cooled, the pawpaw survived in pockets and then reemerged. The seeds were likely carried north and east by large megafauna such as giant ground sloths or mastodons. Judging by the size of the seeds, it seems like pawpaws were suited for megafauna intestines!

There's speculation that Native Americans may have helped extend the range of the fruit and even selected the best seeds to carry with them to other locations.

The CRFG article mentions that they made rope from the bark of pawpaw trees. But stripping the bark can kill the tree, so it seems likely they would have only pulled bark from trees with inferior fruit and left the trees with the best fruit to carry on.

I grew up in Vincennes Indiana and as mentioned, I had never heard of pawpaws. So I posted a question about pawpaws in a locally-popular Facebook group called "Vincennes Indiana Remembers." I got almost 200 responses from people who loved or hated pawpaws. Many did know about the fruit and pointed out where those trees could be located in local parks or some woods or up the river. I'm adding some of the comments below because they are both amusing and informative. I like the "down-home" comments about Grandma Cobb and Earl and Sara as if everyone in town knows them. As I read through the responses, I started to remember pawpaws. I remembered the tree at a local park and I remembered them squished on the ground. But I never tasted one until recently. As kids, we knew where all the fruit trees and berry bushes were located (at least the ones with branches hanging into the alleyways), but no one ever pointed out pawpaw trees and said we could eat the fruit.

We recently went back to Robert and Carol's place and got a chance to taste his pawpaws. They were delicious. I have to say they taste best when they start to get black spots and look a little ugly. Maybe that is why supermarkets don't sell them. Maybe pawpaws will make it to shelves someday through the efforts of Neal Pearson, Andrew Moore, and our own Robert, or at least become appreciated as a locally-picked delicacy in places where they were "forgotten."

Here are some comments from the Facebook group:

- “The nickname is the Indiana Banana! Grandma Cobb has a tree on a hill in front of her house!”
- “The Hoosier National Forest has pawpaw trees.”
- “We have a few trees. The squirrels will get them quick.”
- “There were trees in the woods across Red Skelton bridge (this was a hilly area on the other side of the Wabash river and former site of a Miami Indian village)”
- “My grandmother had one in her back yard, I think they tasted nasty.”
- “I have hundreds of them in my woods.”
- “I remember a song about these. ‘Where oh where is sweet little Nellie? Picking up Pawpaws and putting them in her pockets. Way down yonder in the Pawpaw patch!”
- “We had a couple of trees around our house when I was a kid. I used to pick one on my way to the bus stop and eat it on the bus. If they’re not ripe, they’re bitter. There’s a short window of time to find them ripe on the tree, and you have to compete with the raccoons…they love them.”
- “Earl and Sara Fair showed me how to identify, pick and prepare them.”
- “BTW, if you see a zebra swallowtail butterfly, you can't be far from a pawpaw as their caterpillars feed on pawpaw leaves.”
- “Used to find them in various woods when I went mushroom hunting in the spring time. They smell like over-ripe bananas“
- “They're all over the horseman's campground in Brown County State Park”
- “I find the taste to be something of an acquired one--rather like overripe bananas mixed with pears in a smushy consistency.”

- “My grandma had one. I love them. She made a pie and pudding that was great”

- “I had a pet raccoon that I used to take fishing with me when I lived in Missouri back in the late 70s he wandered off one day while I was busy catching fish. When he came back his stomach was stuffed full and he was carrying something in his mouth. Yep you guessed, a paw paw. I never did find those trees.”

- “When I lived in Indiana we had over forty trees. You had to beat the coons to them....🙂”

- “I was always curious about that tree and its fruit. My mom said they were squishy and got slimy in the yard so she didn't like them. I wish I had tried them when I had the chance.”

- “I never tried them either. My mom said we wouldn’t like them. I think grandma and grandpa said the same thing. They always told us to avoid the area BECAUSE they were soft and slimy after they fell.”

- “I remember the PawPaw trees on my grandfather Hofmann farm out Hwy 33 in Illinois. We would shake the trees so the ripe ones would fall out. Would be very yellow when ripe. If I remember they had seeds. Funny being 89 years I can remember.”

Easy, Economical and Rustic Potting Bench Shelves
by Jenny Weaver

During all this time of "Staying at Home" many of my friends organized their closets or kitchen cabinets. I prefer being outside so I tackled my "someday" project of improving my potting bench.

Originally I had just a sturdy table that has been in my family since we made it from found beach lumber in 1970. It got repurposed from a dining table to a potting table. But it had no shelves so it accumulated a lot of clutter (for future projects). There were always things in the way when I wanted to pot up or make a flower arrangement.

Tom and I went to Pacific Lumber in San Luis Obispo and looked at their stacks of unique lumber cut from trees that had fallen or had to be removed. We found a wonderful, long slab of Cypress that was 19 feet long and over 2 inches thick! It was 17" wide at one end and 12" at the other. In some places it still had the bark attached to one edge and I fell in love with it! Pacific Lumber rough cut the board into my desired shelf lengths (9', 5' and 4') so we could get it home on top of the car.

I sanded the board and Tom cut some blocks of wood for me and attached them to the bottom of the shelves. Now I have everything I use or have collected on the shelves and plenty of room to make a bouquet or pot up some cutting or plants.

The slab of Cypress wood cost about $160 but I think it was a deal. I had looked online and found custom made rustic potting benches offered for up to $800!!

Pacific Lumber also had a mountain of boards and pieces of wood that had been discarded. They let us climb around and we found a beautiful black walnut board that was free!! Pacific Lumber said that every few years they throw all the rejected wood into the shredder. I couldn't bear to know that black walnut was going to get shredded. It may become a bench or a bar top for outside when someday we can have friends and family over!

P.S. I recently heard that Pacific Lumber was moving to Paso Robles.

Slab of black walnut found in a "free" pile at Pacific Lumber. Tom calls this a giant slice of bacon!

2020 Fuyu Persimmon Update
Dara Manker

In the November newsletter we mentioned that the local fuyu persimmon trees we know of (one owned by Dara in Oceano, the large persimmon orchard on Huasna Road in Arroyo Grande, the 2 CRFG orchard trees, and the fuyu of a friend who manages a fruit orchard in Arroyo Grande), all had very light yields this year. Last year, most of these trees had bumper crops. The year before that, the persimmon orchard on Huasna had very few persimmons.

On the other hand, a friend in Fresno has three trees that put out hundreds of fruit this year.

We asked for your experiences with fuyus this year. Here are your comments:

Larry- San Luis Obispo:

> Dara, you asked about people's experience with Fuyus this year, my experience with the two fuyu trees that I have picking rights to, one fairly young and one quite old, is similar to what others have reported, very little fruit this year. I originally thought that squirrels may have stripped the green fruit earlier, but it sounds more like some wider spread issue, perhaps weather. I recently visited a friend in AG and she also reported that her usually-loaded fuyu tree produced a very light crop this year. That said, Hachiya trees seem to have produced good crops again this year, and I probably picked 8 five gallon buckets full. The birds are feasting on the last of the Hachiyas now as they ripen on the trees.

Jenny- Pismo Beach:

> In response to the November Newsletter asking about crops in 2020, I saw a much smaller crop of Hachiya and Fuyu persimmons.
>
> I care for my neighbor's backyard orchard and last year I made about 100 Hoshigaki from the Hachiya tree and gave away the same amount. This year, I only made 32 Hosigaki and gave away about 30 Hachiyas. They were enormous fruits tho!
>
> The unknown Fuyu had a smaller crop this year too.
>
> I have a Giant Fuyu, that I got from CRFG many years ago. It has never had fruit. I will try grafting scion wood from the unknown but delicious Fuyu from across the street.

Jesse- San Luis Obispo:

> My neighbor's fuyu persimmon was also very light this year and they

usually have a large crop.

Ron- Paso Robles Eastside (Country Club):
Last year my Fuyu had a bumper crop and the Hachiya a fair crop. The Fuyu tree is 50 years old. This year both trees had very little fruit. In fact the Hachiya had only three fruit of which the birds ate one.

Tom- San Luis Obispo:
My large Fuyu persimmon tree had next to no fruit this year...and the birds got most of them.

Art DeKleine wrote a very interesting paper that has bearing on this subject and I asked him if it would be ok to include it in this newsletter. He said yes. Art's paper follows. Enjoy!

Alternate Year Bearing (AYB) Case Study for Chestnuts

By Art and Carl DeKleine

Introduction.

Alternate Year Bearing (AYB) refers to the tendency of fruit and nut trees to produce a greater than average crop one year, and a lower than average crop the following year.

It has been noted with increasing concern that chestnuts also exhibit AYB. It will be exceeding difficult for Chestnut Growers, Inc. (CGI) to have a profitable business if AYB cannot be mitigated.

To help understand AYB in chestnuts, we will reference AYB in other nut and fruit tree crops, especially pecans and apples.

"*Crop load in apples is hard to manage. Most apple varieties, most years, will produce too many flowers and will try to produce too much fruit – resulting in small fruit of poor quality. In alternate year bearing varieties, a year following a large crop will produce a year with a very small crop.*" Dr. Steven Van Nocker, MSU.

(1) Quantifying AYB

An **AYB Index** has been useful in other crops to help identify AYB characteristics. Understanding the index is helpful. Understanding the index is challenging.

The AYB Index, ***I***, measures the crop-load change from year to year.

Let's concentrate on the first transition $a_1 \Rightarrow a_2$. Let's call $C = a_2 + a_1$ the **crop load**, and $\Delta C = |a_2 - a_1|$ (the absolute value of the difference) the **change in crop load**. For this single transition,

$$\boldsymbol{I} = \frac{\Delta C}{C} = \frac{|a_2 - a_1|}{a_2 + a_1}, \qquad 1 \geq \boldsymbol{I} \geq 0, \qquad 1 \equiv \textbf{Bad} \text{ ----> } 0 \equiv \textbf{Good}$$

Let $a_1, a_2, a_3, \ldots, a_n$ denote a sequence of crop yields over an n-year period.

$$\boldsymbol{I} = \frac{1}{n-1}\left\{ \frac{|a_2 - a_1|}{a_2 + a_1} + \frac{|a_3 - a_2|}{a_3 + a_2} + \ldots + \frac{|a_n - a_{n-1}|}{a_n + a_{n-1}} \right\}$$

The n-year periods give rise to (n-1) transitions; $a_1 \Rightarrow a_2$, year 1 to year 2, for example. The index $\boldsymbol{I}$ simply averages the yearly changes.

It is common in many fields of study to consider a percentage change *p* in crop yield,

$$a_2 = p \bullet a_1 \qquad\qquad 0 \equiv \textbf{Bad} \text{ ----> } 1 \equiv \textbf{Good}$$

Knowing p and a_1, helps us calculate a_2. For example, if we want to determine next year's crop size and anticipate a 30% decrease, we can solve $a_2 = 0.70 * a_1$.

The AYB index has some nice properties: It is easy to use and understand. If the crop yield goes from a_1 to 0 (total loss), $\boldsymbol{I} = 1$ (100% loss). If the crop load stays the same, $a_2 = a_1$ (no change of yield), $\boldsymbol{I} = 0$. The values of $\boldsymbol{I}$ are always between 0 and 1.

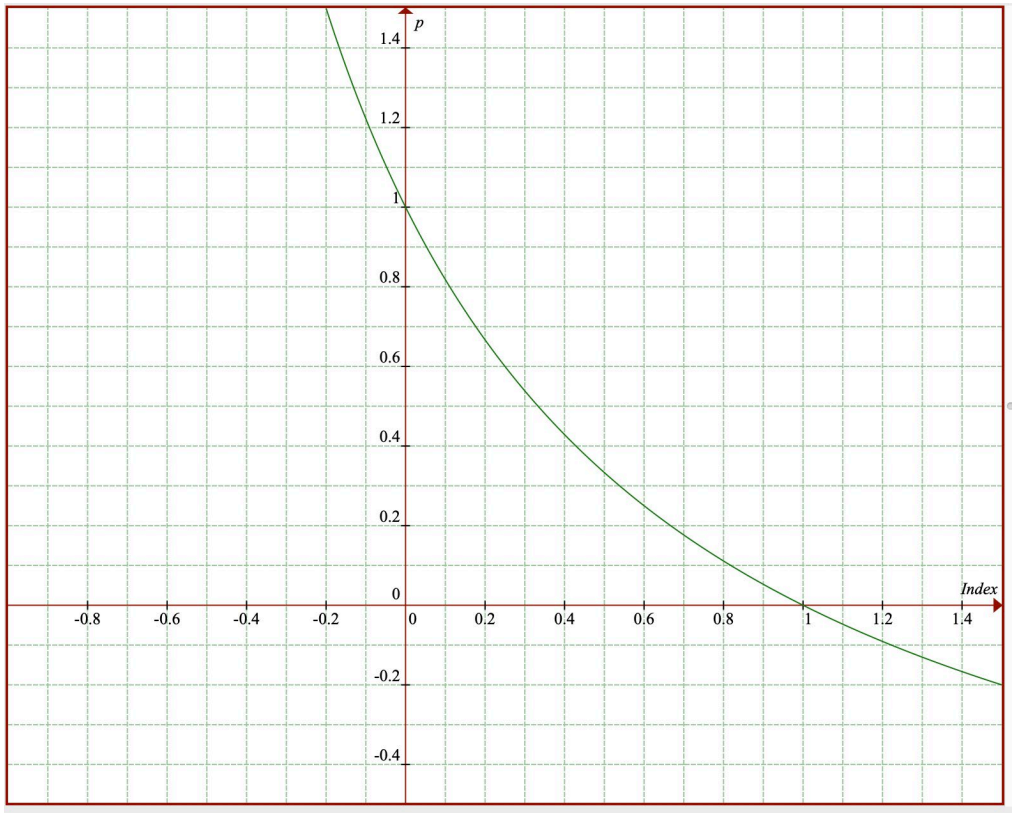
Percent change p in crop yield from one year to the next is also easy to understand.

Note: What we would like to do now is use $\boldsymbol{I}$ to calculate the percent change p in crop yield, and visa versa. The (1,0) AYB index changes to a (0,1) percentage-chance relationship.

Creating an index $\boldsymbol{I}$ using percentage change p requires some analysis,

$$I = \frac{\Delta C}{C} = \frac{|a_2 - a_1|}{a_2 + a_1} = \frac{|pa_1 - a_1|}{pa_1 + a_1} = \frac{1-p}{1+p} \text{ , and } \quad p = \frac{1-I}{1+I}$$

The following graph and table illustrate how $\boldsymbol{I}$ and p are related. For example, if $p = ½$, $\boldsymbol{I} = 1/3$.



(2) The rationale for looking at other nut and fruit-tree crops.

Although the common AYB disorder is exhibited by many nut trees (Acorns, beech nuts, walnuts, pecans, filbert, cashew, pistachio, …), temperate fruit trees (Apples, apricots, peaches/almonds, pears, prunes, …), sub-tropical fruits trees (Avocados, olives, …), tropical fruit trees (Litchis, mangos, …), and citrus trees, we will primarily consider AYB research associated with nut trees closely related to chestnuts.

Plants and trees (much like animals) are remarkably similar in their functions and characteristics. The sun shines down on the earth at a constant rate and provides solar energy for the trees. The leaves use the solar energy to capture carbon and turn it into carbohydrates (sugar). Photosynthesis is remarkably similar across all plants. The tree distributes the carbohydrates to various parts of the plant to help it grow. Some of those carbohydrates are used to make nuts (the reproductive tissue).

Since plants of similar classification have similar genetics, plant chemistry, phenology, and characteristics (including AYB), studying plants with a similar classification will provide reasonable conjectures for chestnuts. Pecans seem to be the most highly studied AYB tree nut.

A word of caution – not all varieties are the same. Each variety has its own identifying characteristics. An AYB Index has been calculated for 12 pecan varieties, from 0.32 to 0.72 (from p = 0.515 – <u>half of the crop is lost</u> – to p = 0.168 – <u>less than 1/5 of the crop is lost</u>).

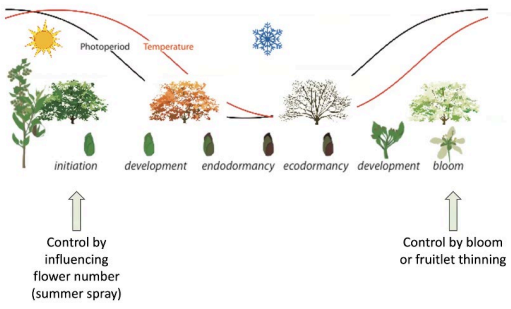
(3) Understanding the mechanisms responsible for AYB.

Although many factors affect crop load, carbohydrate availability seems the most important.

And where does the tree get its carbohydrates (energy, sugars, starch, ….)? From the sun by leaf photosynthesis.

And how does the tree regulate its carbohydrate use? Plant biology and hormones.

Simply put, a heavy bearing depletes a tree's energy reserves (carbohydrates) and jeopardizes its flower formation for the coming year, resulting in poor crop yields the following year.



Fruit and nut production is a two-year process.

Chestnuts (and other related tree nuts) produce nut buds for this year's crop last year. Nut buds for next year's nuts will be initiated on this year's shoot growth beyond the cluster of nuts being produced for the current year. Thus, to produce next year's nuts, a branch grows nuts on the tree for this year, grows substantial shoot growth beyond this year's crop to grow nuts for next year, and then initiates fruit buds for next year's crop. During July and August, the amount of energy needed to mature a heavy crop load and support this year's bark, leaves, and roots will most likely exceeds this year's energy production by the sun. To compensate, a tree draws energy for this year from surrounding tissues needed to support next year's crop.

Several observations support the theory that trees rob energy reserves from surrounding tissues: (1) During a heavy crop year one can observe the yellowing of leaves near maturing nuts, a result of drawing carbohydrates from the leaves. (2) In the spring of the year following a heavy crop load, shoot growth is stunted and many new shoots die. (3) There seems to be an inverse relationship between new leaf buds and flower buds – more leaf buds imply fewer flower buds and fewer leaf buds imply more flower buds; leaf buds and flower buds compete for carbohydrates in the spring; and flower buds require a bigger carbohydrate uptake in the spring than leaf buds.

The amount of solar energy arriving at the Earth surface on a clear day is on the order of 1 kW/m^2 per hour. The m^2 area needs to be facing the sun directly, not at some off angle. The tree knows this and thus makes many leaves around the tree looking at the sun from many angles.

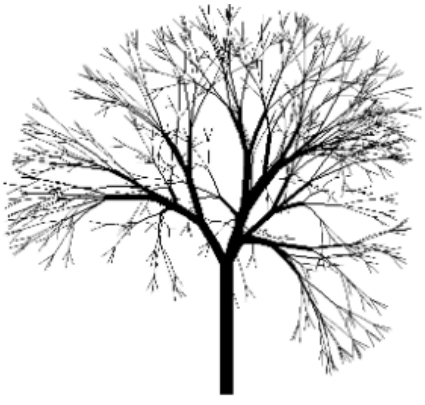
For various reasons, photosynthesis, the process by which green plants transform light energy into chemical energy, is not 100% efficient. Most estimates suggest that photosynthesis is about 5% efficient.

Most trees use about 10% of their annual carbohydrate production for reproduction (flowers, nuts and fruit). This puts a limit on the amount of nuts a tree can produce in one year. Our task is to figure how the tree responds when asked to produce an over-abundance of nuts.

(4) A proposed protocol to minimize chestnut AYB.

Since the crop size in a given year is determined during the spring and summer of the previous year, the proposed protocol should be used in the early post pollination period each year, 7-9 weeks after pollination when one can observe a small embryo inside a growing ovule.

Step 1. Measure the trunk diameter *dT*, in inches, about waist high. Measure the canopy radius rC in feet.



Note, the trunk diameter will help estimate the number of potential nuts on the tree. The canopy diameter will help estimate the yearly calories provided by the sun.

It $rC \approx 1.5 * dT$, one number can be estimated measurement from the other.

Da Vinci wrote in his notebook that "*all the branches of a tree at every stage of its height when put together are equal in thickness to the trunk.*"

Step 2. Estimate the number N of burs on the tree.

References:

> www.canr.msu.edu/news/estimating_crop_load_in_edible_chestnuts
>
> ***Opportunities for Early and Accurate Crop Estimates***, MSU Extension, Pete Conrad and Erin Lizotte.

Step 3. Using a 25-bur count, estimate the proportion *p* of burs having a visible growing ovule.

Assume that each visible growing ovule, given the opportunity, will give rise to a viable nut bur. Assume also that each viable nut bur will provide 0.11 lb/bur (50 g/bur) of nut meat, and that a reasonable estimate for fresh chestnuts is 756 Cal./lb.

Step 4. Calculate the hypothetical number of calories C^* for the tree in question.

$$C^* = N * p * 0.11 * 756$$

Step 5. Calculate the canopies shaded area in ft^2.

$$A = \pi * (rC)^2$$

Assume that

(1) The solar energy reaching the tree = 1 kW/m^2 = 860.42 $Calorie/(m^2 \cdot hr)$.
(2) The tree will receive 860 hours of sunshine during the growing season.
(3) Solar energy per season = 739,961$Calories/m^2$ = 68,744 $Calories/ft^2$.
(4) Photosynthesis is about 5% efficient.
(5) The tree's energy from the sun = 68,744 * 0.05 * A Calories.
(6) Chestnut AYB can be mitigated by using 6% of the year's energy supply.

Step 6. Calculate the suggested carbohydrate level to be used by the tree for nut production that will mitigate AYB.

$$Cal = 206.232 * A$$

If $C^* > Cal$, It would be wise to remove burs from the tree. $C^* = Cal$ would be ideal.

Step 7. If $C^* > Cal$, remove the proportion Cal/C^* of nuts from the tree, retaining $[1 - Cal/C^*]$ nuts on the tree.

Big question. Can chestnut growers develop an easy economical method to remove burs from chestnut trees early in the season?

Example:

Step 1. dT = 4.7”, rC = 7’, (rC = 1.49 dT, close enough)

Step 2. N = 830

Step 3. p = 0.88, (22 out of 25 visible growing ovule)

Step 4. $C^* = N * p * 0.11 * 756 = 60{,}740$ Calories

Step 5. $A = \pi * (rC)^2 = 154\ ft^2$

Step 6. Cal = 206.232 * A = 31,724 Calories

Step 7. C^* > Cal, therefore remove 52% of the burs and retain 48%.