Turning Over a New LEAF:

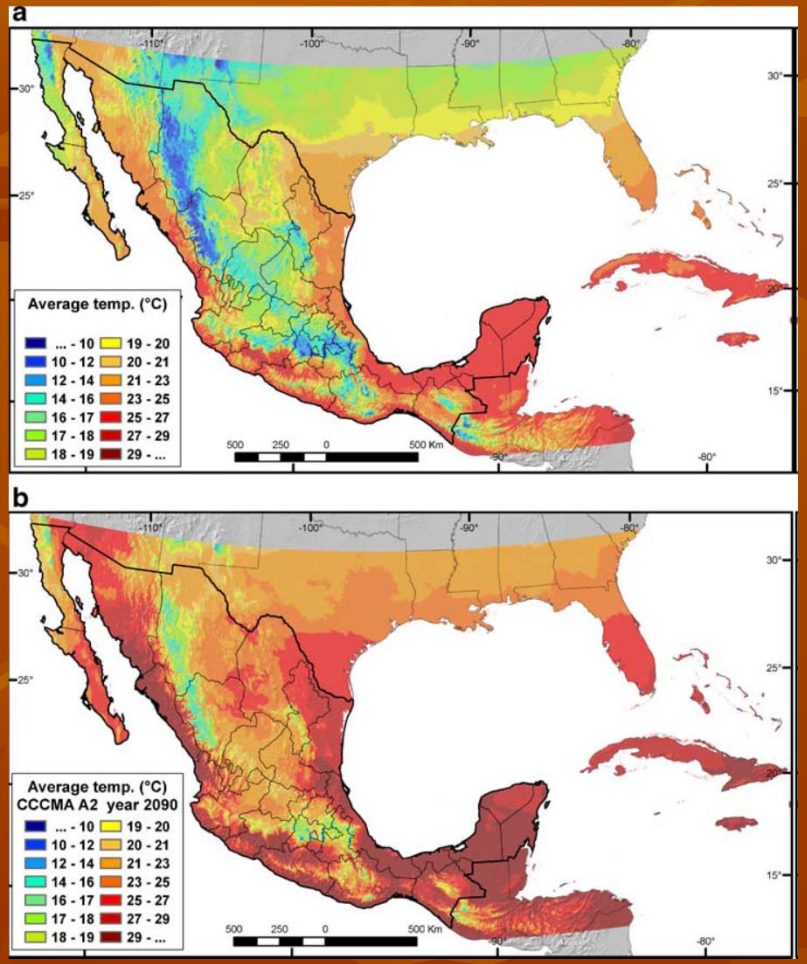
Empowering a New Generation of Orchard-Keepers To Grow Low Chill Fruits & Nuts In a Time of Rapid Climatic Change

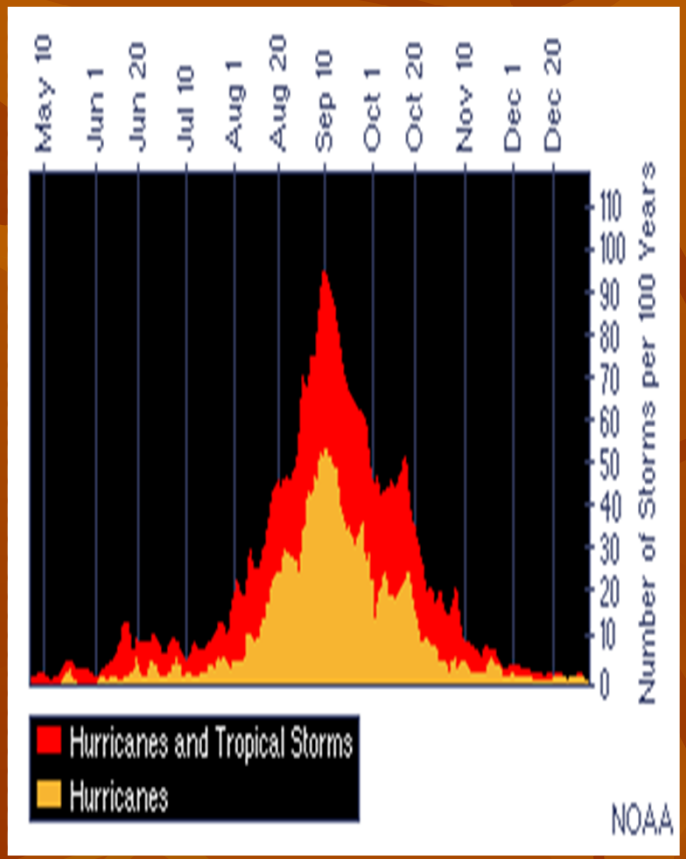
www.garynabhan.com

Why we need new fruit growers now more than ever before

- 1. Our “antique fruit growers” are becoming antiques
- 2. Annual seed crops require far more tillage, water & other inputs than trees, adding to our carbon foodprints
- 3. Trees sequester carbon, stabilize soils, survive most droughts & reduce our foodprints

But climate change is upon us & will dramatically effect what fruit, nut & grape varieties we can grow & where!





In much of California & Arizona, we've lost 500 chill hours from fruit growing sites since WWII, & night-time summer temp.s have risen 2 -3 degrees C

- Many stone fruits have already lost 1/2 the chill hours they require, reducing their fruit yield & quality
- By 2050 across the West, 60%+ of the grape vintages will be grown under conditions **no longer** optimum for their wine quality

At the same time, catastrophic weather is disrupting efforts to grow place-based crops in their traditional homelands

- In 2011, 500 counties declared national climate-related disaster areas
- In 2012, more than 1500 declared disasters
- Droughts, floods, pests & more severe hurricanes are on the rise, devastating entire crops some years

Because we'll ***never again*** pump as much fossil fuel & water to grow & transport pampered food as we did last century,

changes in our food system are happening *fast*

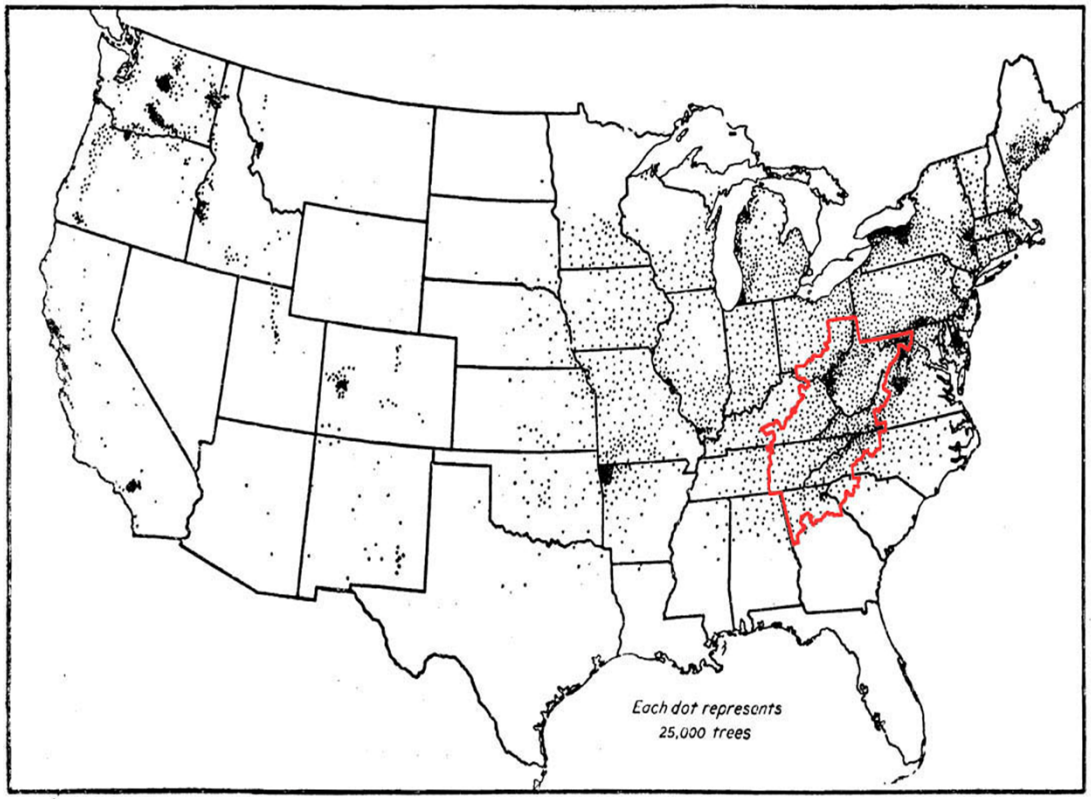
- Instead of pumping fossil fuel & groundwater, let's return to the local resources & values to *sustain food production*:
- 1. The *biological wisdom* in food biodiversity adapted to place.
- 2. The *cultural wisdom* in traditional agro-ecological know-how.
- 3. The *resources in reach (*rainfall, manure, bio-char, beneficial insects, native pollinators) to replace imported inputs

To slow climate change, we need orchards more than ever before!

- A dwarf fruit tree may sequester as much as 28 pounds of CO2 a year, a larger semi-dwarf or full-sized tree 220- 260 pounds annually.
- Their carbon sequestration into their root mass and surrounding soil may peak in 20 years, while fixing 5000 lbs of carbon over its productive life span.
- An acre-sized apple orchard can fix as much as 20 tons of CO2 from the air each season, while it releases 15 tons of oxygen, and provides over 5 billion BTU's of cooling power.

Around 1900, Americans grew 20 million apple trees of 6650 varieties! What happened?

- By 1950, we had less than ¼ of those trees left in the landscape, & by 2000, we had less than 3500 var.s in nurseries. We're losing 75 apple var.s per yr!

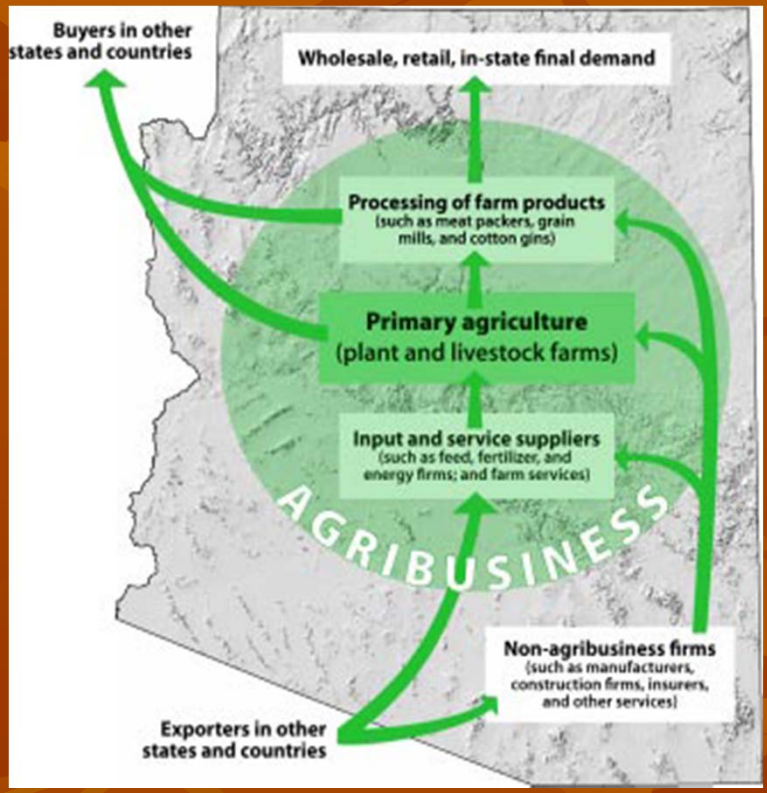


Apple plantings in the United States in 1925. Appalachia (highlighted), excluding Alabama, Mississippi, and Pennsylvania. Each dot represents 25,000 trees. (Fig. 12, USDA Yearbook, 1927)

We need recruit youth not just as orchard-keepers or fruit chefs, but also as professionals in a variety of other fields as well

- Nurserymen
- Food folklorists & fruit historians
- Guerilla grafters
- Community kitchen canners
- Youth orchardkeepers
- Food systems economists

We also need to redesign our orchards & our food systems to foster diversity



Each region in the country has a cornucopia of heirloom fruits adapted to different conditions

- In Arizona alone:
- 17 heirloom apples
- 12 stone fruits
- 8 citrus varieties
- 5 dates & 13 olives
- Plus pomegranates, figs, jujubes, prickly pears, pears, pecans, & quinces

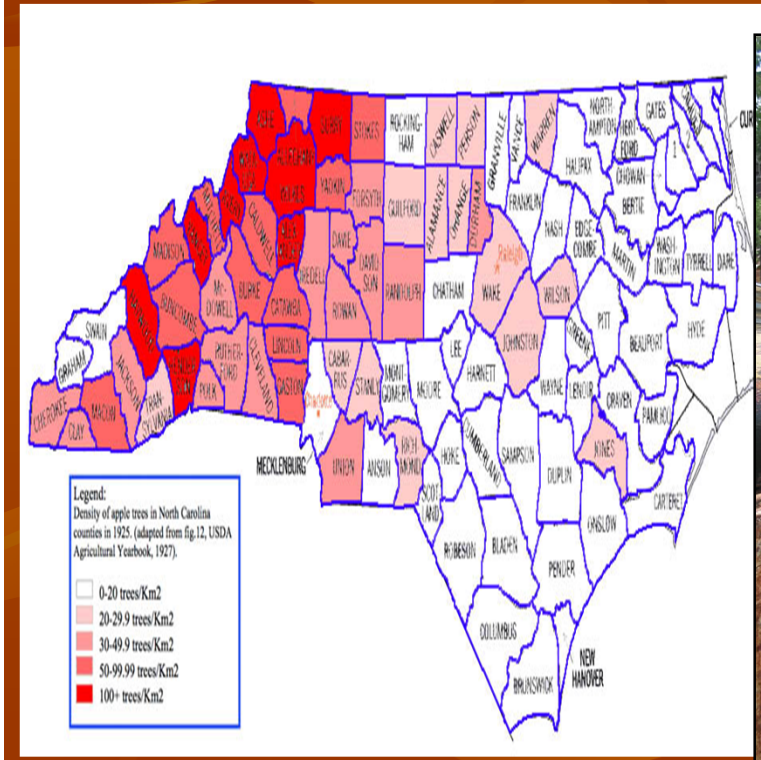
We've undertaken the 1st full survey of America's unique place-based heritage foods, noting which are at risk, where & with whom

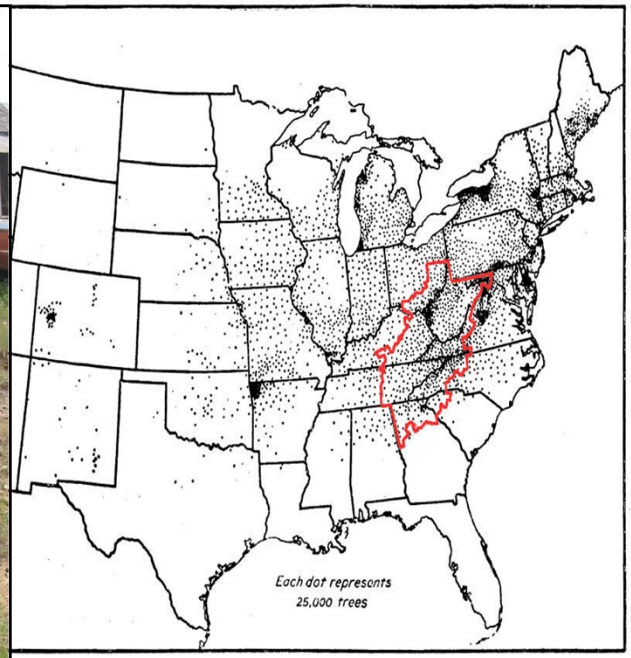
- Participatory multi-cultural workshops of farmers, orchard keepers, & chefs determine what is at risk, in which places & among which cultures
- Collaborations ignite & guide recovery efforts for species, stocks & habitats, recipes

Three years ago, RAFT released the *first-ever* strategy plan for recovering America's most diverse crop— *the apple---* *& APPLE CULTURE AS WELL!*

- 16,000 apple varieties once grown in U.S., now only 3500 in nurseries
- Of those 3500, 94% are threatened or endangered
- Only 12 varieties provide 90% of those bought in groceries
- Much of our juice & puree is imported from China –with arsenic & a big carbon foodprint!
- But many encouraging signs as well

Seeking Out Where Forgotten Fruits May Still Grow: Apple-achia is *the* Historic Center of Apple Diversity:





ted States in 1925. Appalachia (highlighted), excluding Alabama, vania. Each dot represents 25,000 trees. (Fig. 12, USDA Yearbook, 1927)

But Kanin Routson has also found astonishing levels of diversity in abandoned orchards in the Southwest!

- In leaf samples or 280 trees from abandoned or historic orchards in AZ, UT & NM, Kanin found 160 “unknowns” in addition to 34 commonly propagated heirloom apple var.s
- The 160 unknowns were NOT closely related to 110 heritage apple varieties that dominated orchards in the late 19th & 20th centuries
- Upshot: there is considerable diversity to draw on that is still hidden in Arizona landscapes!

For the future of fruits in the West, we will clearly depend more on "Mediterranean"/North African heirlooms

- Jesus Garcia & Rafael Routson have shown just as much diversity in Spanish-introduced citrus, stone fruits, dates, quinces, figs & pomegranates hidden in the *huertas* of Arizona, Baja California, California & Sonora

As for low chill-requiring fruit, there's lots of varieties that do well with less than 600 hr.s

- 5 almonds, 19 apples,
- 7 apricots, 4 cherries
- all dates, 9 figs,
- 6 kiwis, 6 jujubes
- 8 nectarines, 18 peaches
- 9 pears, 5 pecans
- & virtually all citrus

If you are a fruit explorer or aficionado, there's plenty you can do!

- Help find & bring back to our tables the 100 rarest fruits unique to your region
- Support fruit CSAs, hard cider makers, & orchard-keepers at farmers markets
- Find abandoned orchards & taking scion/cuttings to graft
- Celebrate the Year of the Heirloom Fruit with local tastings
- Write local strategy plans for regreening cities with heirloom trees to cool climate/hold carbon

& if you cook or ferment, you can determine which varieties make the best value-added products

Its time to that fruit growers see themselves as *collaborative conservationists*
forging new & lasting relationships between growers, consumers & activists to save & use fruit diversity

- Re-design our orchards & food systems for diversity & resilience
- I've planted 75 heirloom fruit & nut varieties (most accessible from only 1-3 nurseries) & 25 prickly pear & mescal succulents in Patagonia Az as a nursery for my neighbors!

Take a bite (Adam did!), because the future of fruits depends on your participation

A Terroir-ist's Manifesto for Eating in Place

- Know where your food has come from
  through knowing those who produced it for you,
  from farmer to forager, rancher or fisher
  to earthworms building a deeper, richer soil,
  to the heirloom fruit, the nitrogen-fixing legume,
  the pollinator, the heritage breed of livestock,
  & the sourdough culture rising in your flour.

- Know where your food has come from
by the very way it tastes:
its freshness telling you
how far it may have traveled,
the hint of mint in the cheese
suggesting what the goat has eaten,
the terroir of the wine
reminding you of the lime
in the stone you stand upon,
so that you can stand up for the land
that has offered it to you.

- Know where your food comes from
by the richness of stories told around the table
recalling all that was harvested nearby
during the years that came before you,
when your predecessors & ancestors,
roamed the same woods & neighborhoods
where you & yours now roam.
Know them by the songs sung to praise them,
by the handmade tools kept to harvest them,
by the rites & feasts held to celebrate them,
by the laughter let loose that shows our affection.

Know where your foods come from
by the patience displayed while putting them up ,
while peeling, skinning, coring or gutting them,
while pit-roasting, poaching or fermenting them,
while canning, salting or smoking them,
while arranging them on a plate for our eyes to behold.
Know where your food comes from
by the slow savoring of each and every morsel,
by letting their fragrances lodge in your memory
reminding you of just exactly where you were the very day
that you became blessed by each of their distinctive
flavors.

When you know where your food comes from,
you can give something back to those lands & waters,
that rural culture, that migrant harvester,
curer, smoker, poacher, roaster or vintner.
You can give something back to that soil,
something fecund & fleeting like compost
or something lasting & legal like protection.

We, as humans, have not been given
roots as obvious as those of plants.
The surest way we have to lodge ourselves
within this blessed earth is by knowing
where our food comes from.