

Pretty but pungent: The curious case of the callery pear

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SREF Forest Health Webinar Series

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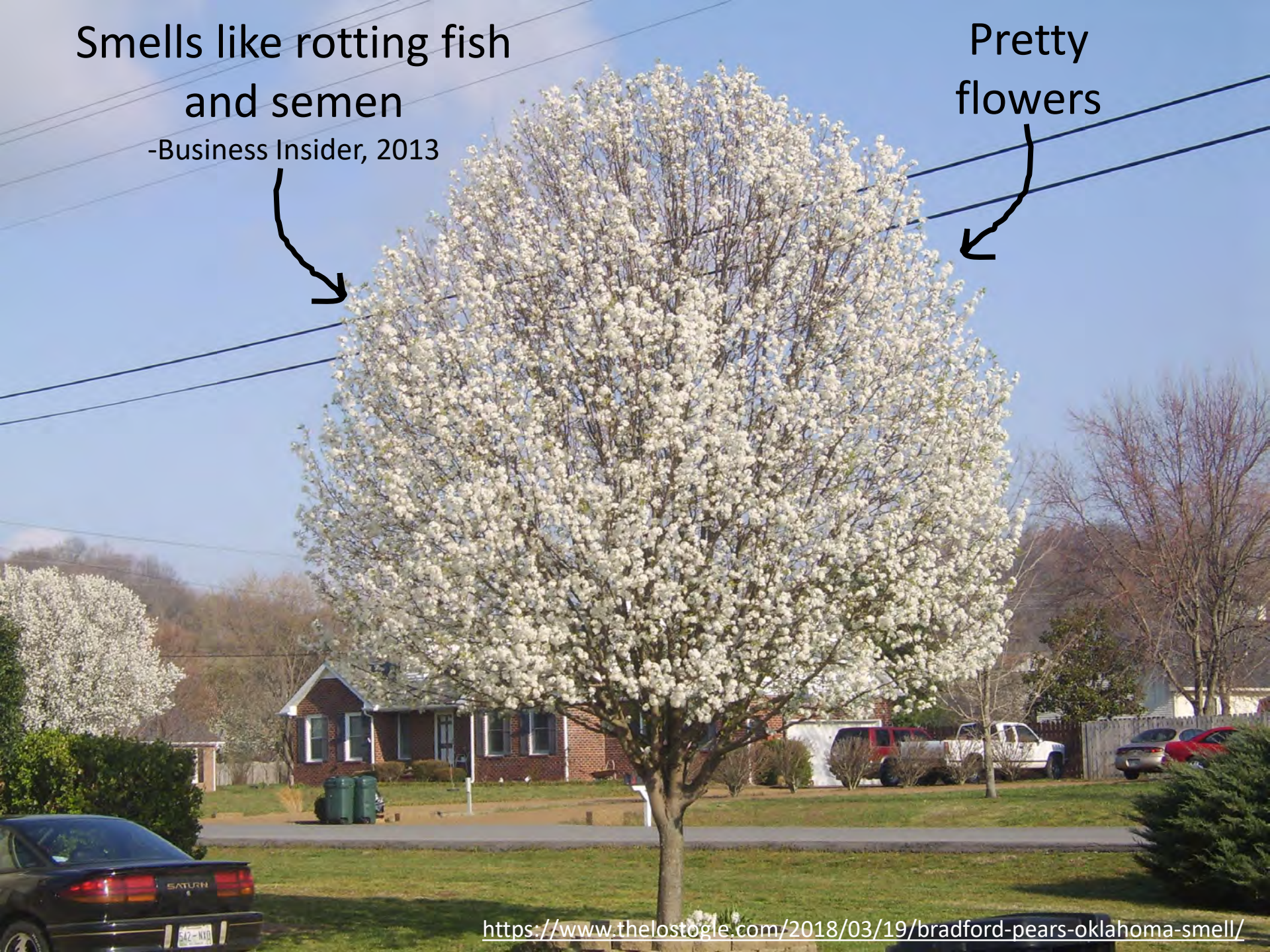
But first...a disclaimer...



Smells like rotting fish
and semen

-Business Insider, 2013

Pretty
flowers



First, we must talk about
fire blight

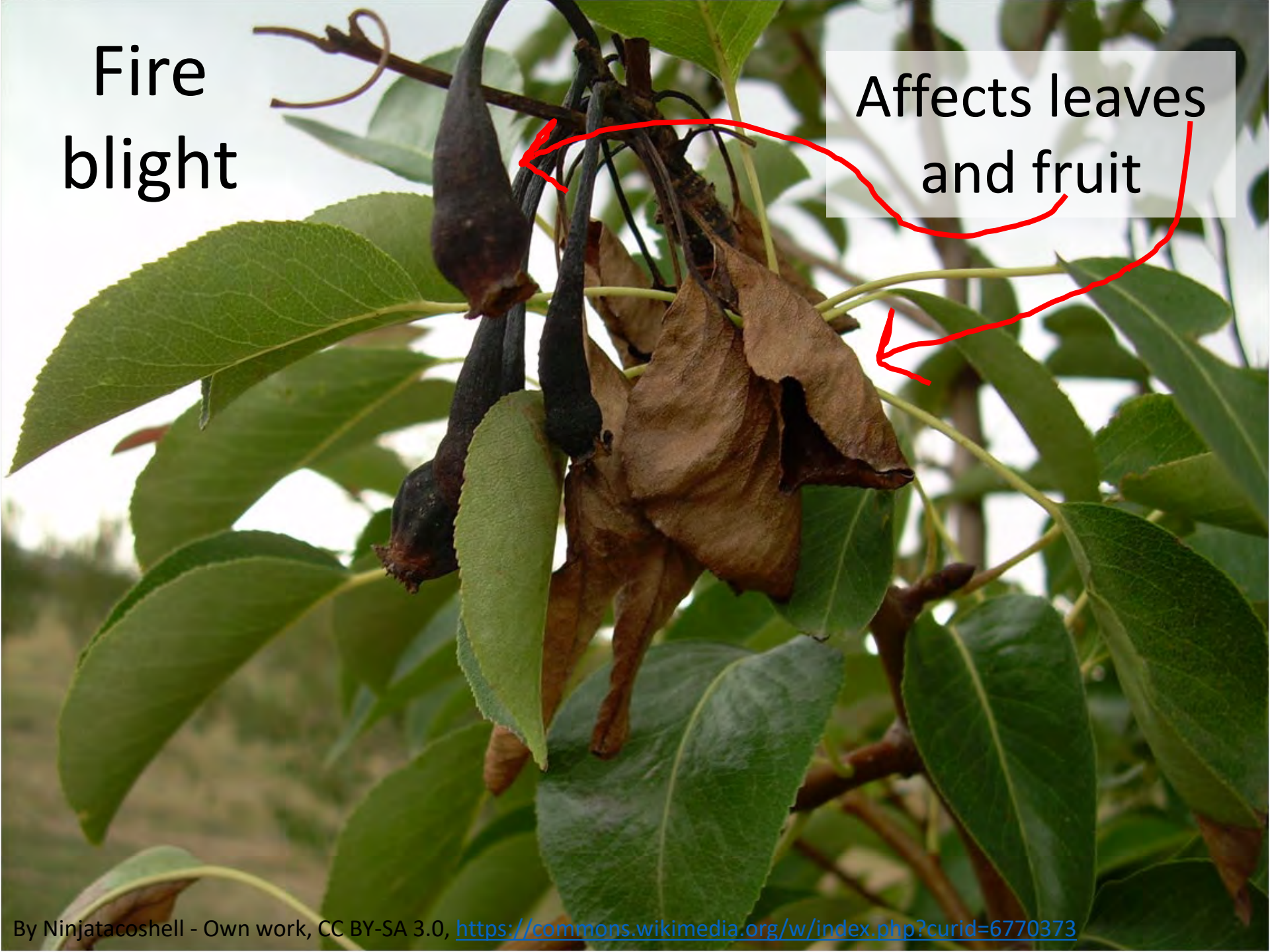
Fire blight

Erwinia amylovora

- Devastating bacterial disease
- Affects pear, apple, other Rosaceae

Fire blight

Affects leaves
and fruit



Fire blight

- Devastating bacterial disease
- Affects pear, apple, other Rosaceae
- Rampant in U.S. in early 1900s
- Spread by pollinators
- The industry needed help



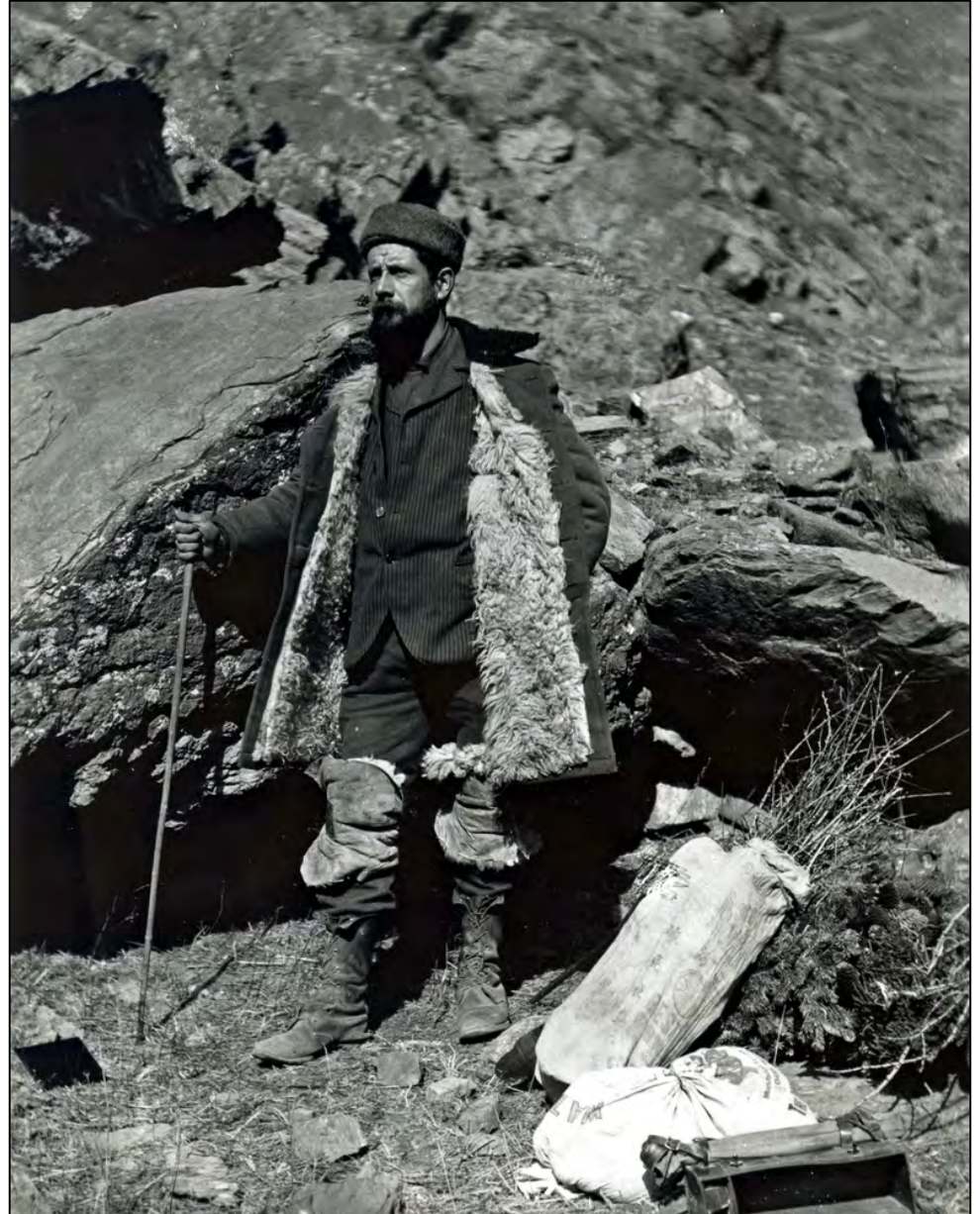
Pyrus calleryana (callery pear)

- Native to Asia (China, Japan, Korea)
- Resistant to fire blight!
- Introduced to U.S. to try to halt the disease
- But...we needed more specimens for experiments...

Frank N. Meyer

1875-1918

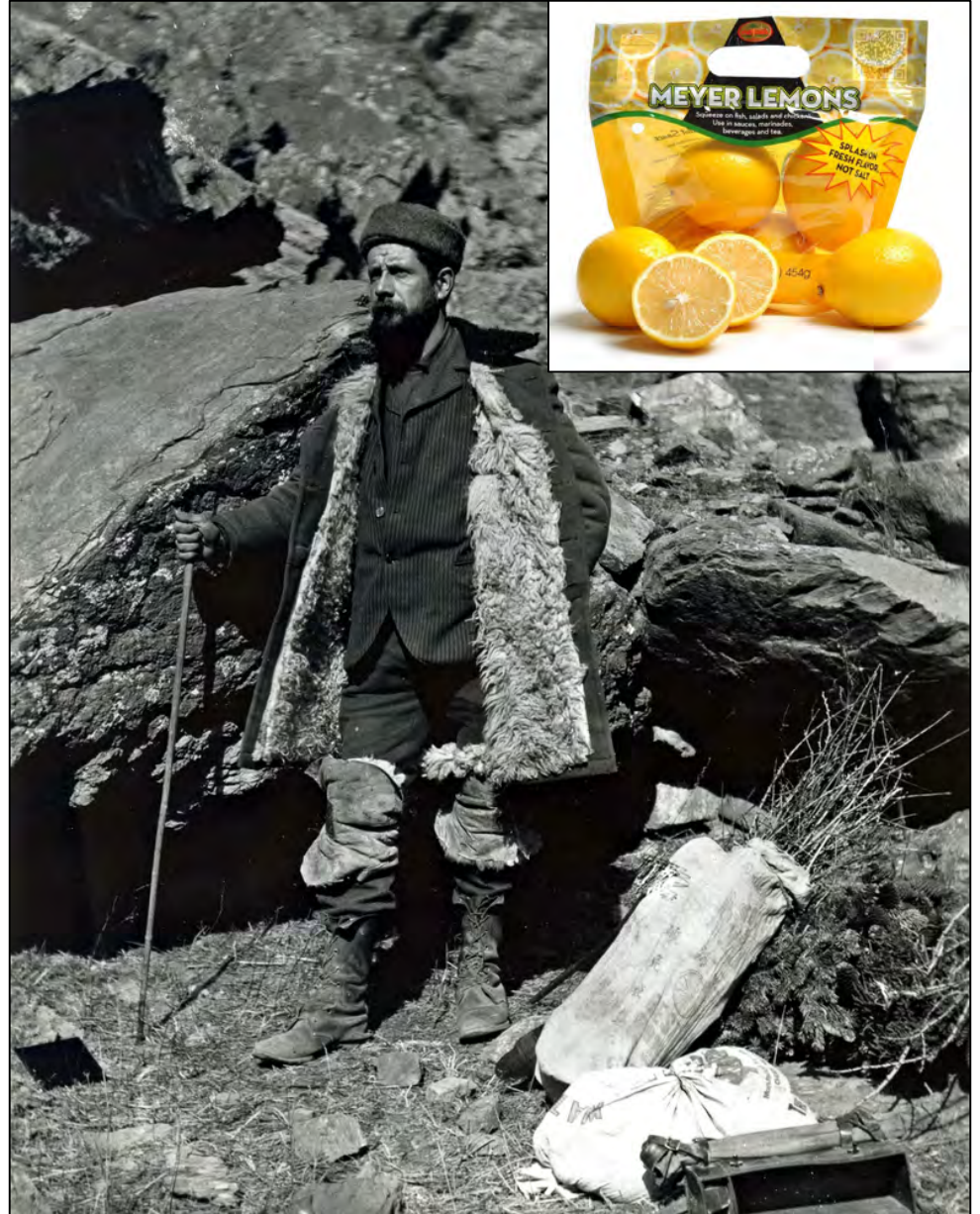
- Worked for USDA Foreign Seed and Plant Introduction Office
- Mission: “to locate and import economically important plants from other regions of the world”



Frank N. Meyer

1875-1918

- Worked for USDA
- Many collecting trips
- >2,500 plants to U.S.
- Frank N. Meyer Medal for Plant Genetic Resources

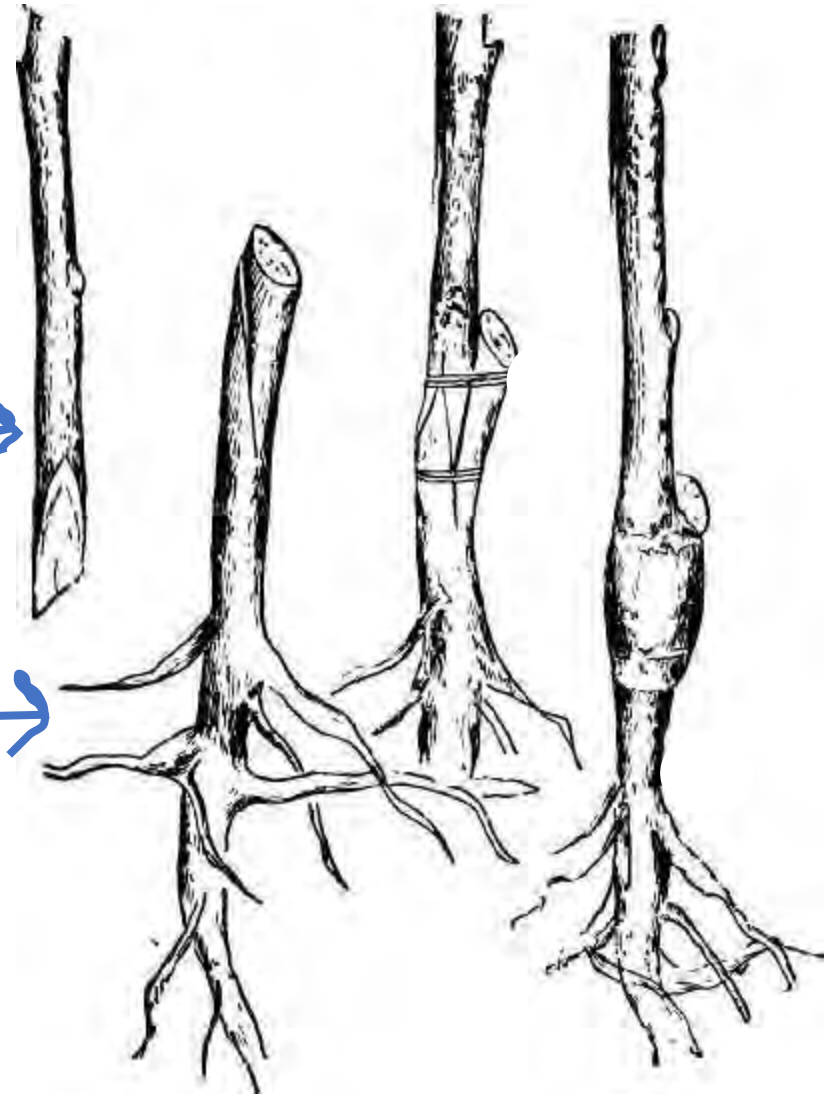


It worked!

- *P. calleryana* helped SAVE the pear industry

Scion from an edible pear

Callery pear rootstock



But then...

- Several outplantings located at the U.S. Plant Introduction Station in Glenn Dale, MD
- Some *P. calleryana* selections had horticultural value
 - Disease resistant
 - Drought resistant
 - Pollution resistant



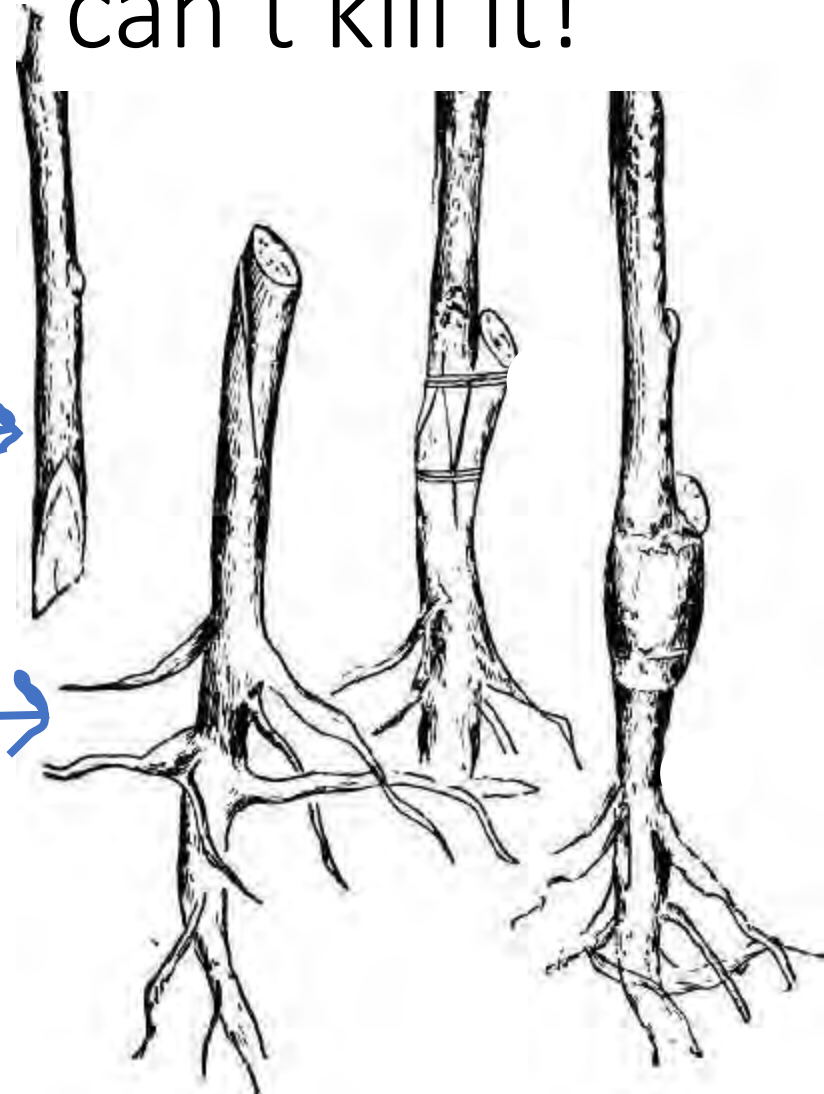
John Creech, Horticulturalist

One selection was OMG you can't kill it!

- Named it "Bradford" after former station director.

All scions were
Bradford
(thornless shoot)

Rootstocks were all
P. calleryana, but of
different genetics



Bradford pear

- Commercially released in 1961
- Escaped cultivation in AR in 1964, 1965 in MD
- Structural problems noticed in early 1980s
- \$23 million in sales in 2009
- Many new cultivars created



Bradford pear: what they knew

Branch structure issues around 25-30 years old



Bradford pear: what they knew

Only Bradford pear = no seeds

Bradford pear + other *Pyrus* = seeds

B B B B B B B B B B B B B
B B B B B B B B B B B B B
B B B B B B B B B B B B B

Bradford pear: what they knew

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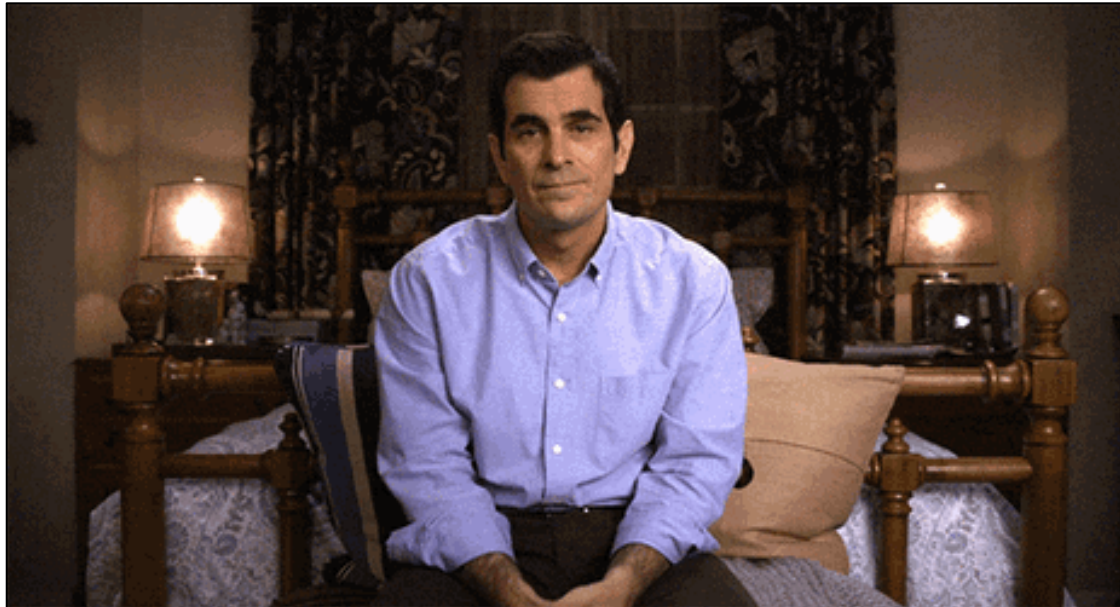
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Bradford pear: what they knew

Only Bradford pear = no seeds

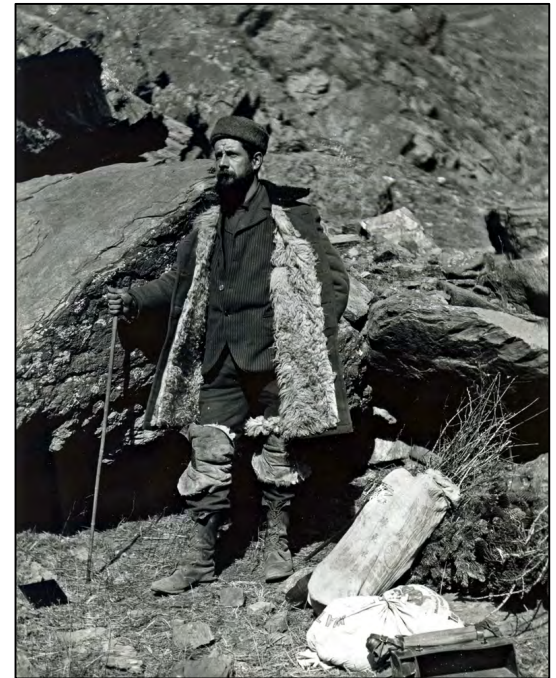
Bradford pear + other *Pyrus* = seeds

Their response?



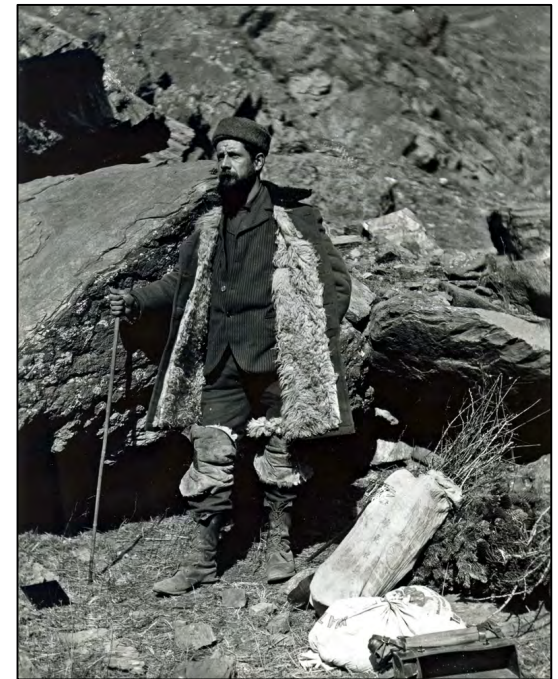
P. calleryana exhibits classic invasive characteristics...

“*Pyrus calleryana* is simply a marvel. One finds it growing under all sorts of conditions; one time on dry, sterile mountain slopes; then again with its roots in standing water at the edge of a pond; sometimes in open pine forest, then again among scrub on blue-stone ledges in the burning sun; sometimes in low bamboo-jungle ... and then again along the course of a fast flowing mountain stream or in the occasionally burned-over slope of a pebbly hill.



...and behaves differently here than in its native range.

“Pyrus calleryana is simply a marvel. One finds it growing under all sorts of conditions; one time on dry, sterile mountain slopes; then again with its roots in standing water at the edge of a pond; sometimes in open pine forest, then again among scrub on blue-stone ledges in the burning sun; sometimes in low bamboo-jungle ... and then again along the course of a fast flowing mountain stream or in the occasionally burned-over slope of a pebbly hill. **The tree is nowhere found in groves; always as scattered specimens, and but very few large trees were seen.**”



So now we have wild callery pear
in old fields...



Along roadsides...



All the white trees

In unsold lots...



For Sale
SVM | SMITH GROUP
COMMERCIAL REAL ESTATE
706-769-8794
Matthew Smith, CCIM
706.340.4018
4.69 Acres
All Utilities Zoned Commercial



In forests...

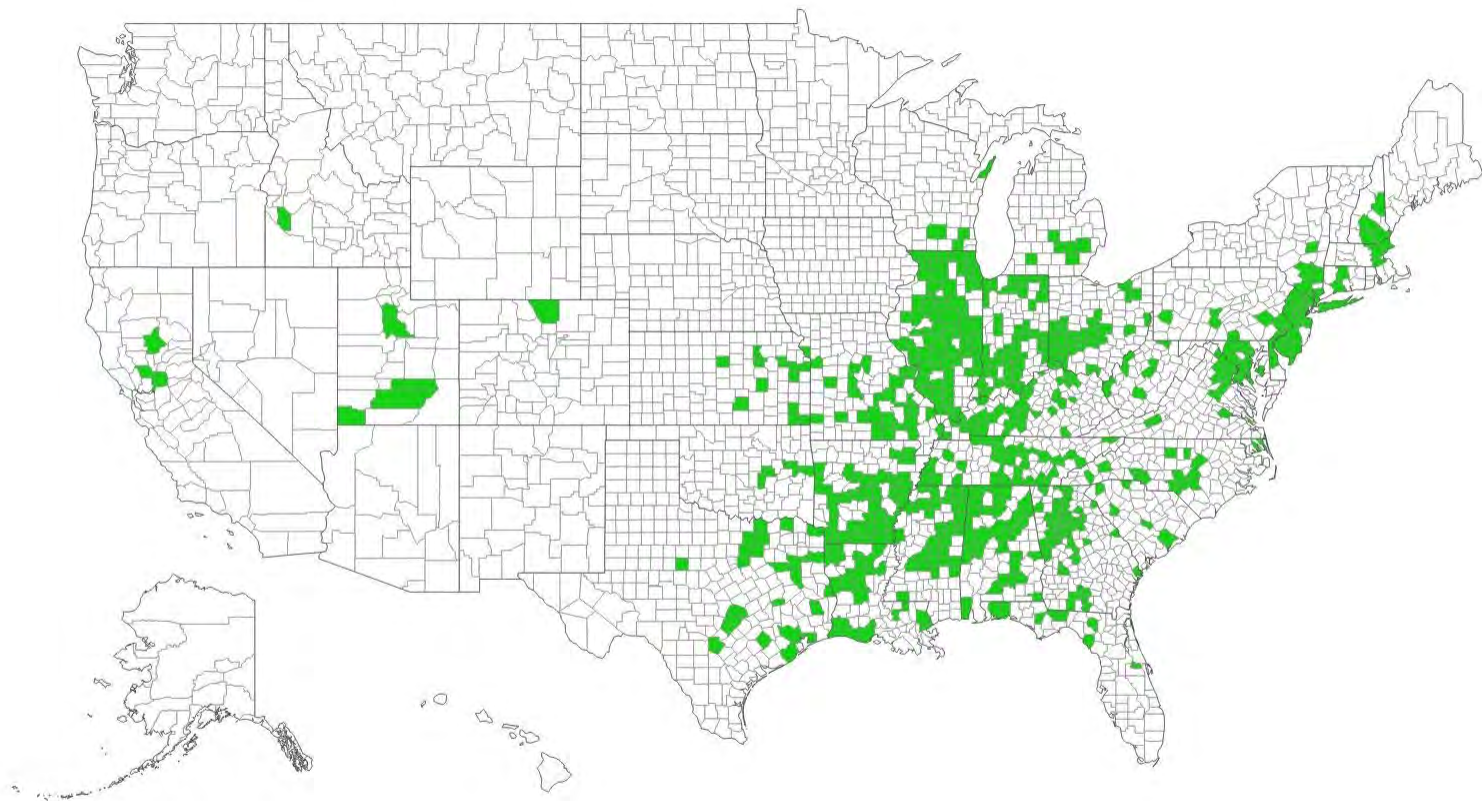


All the green
understory trees

And let's be honest, this map is REALLY incomplete.

Callery pear (Bradford pear) (*Pyrus calleryana*)

EDDMapS
Early Detection & Distribution Mapping System



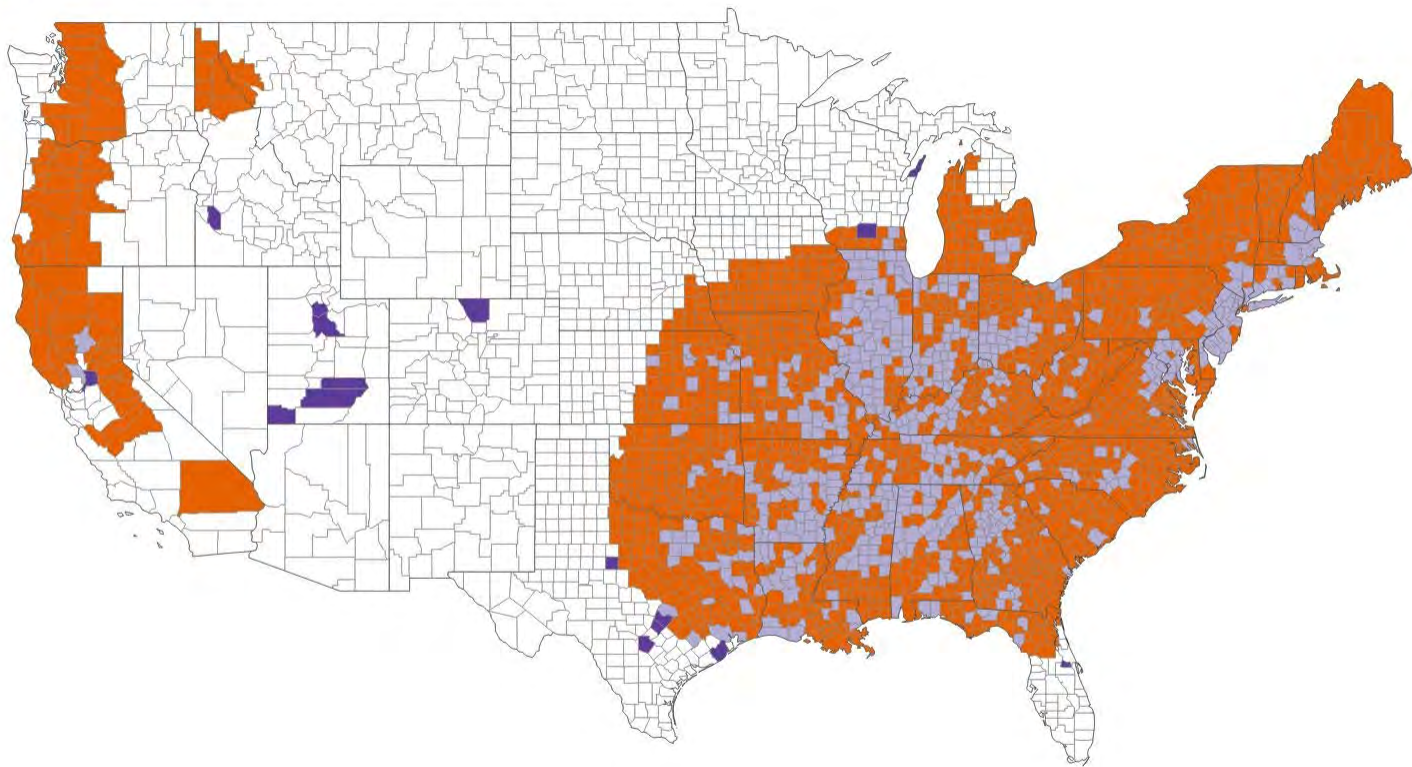
Legend

- No Data
- Species Reported

EDDMapS “Future Range” is closer to the “now” range

Future range of Callery pear (Bradford pear) (*Pyrus calleryana*) by 2040 - 2060 based on currently available evidence

Number of Models



The utility of EDDMapS suffers if we don't have accurate data



But who cares, really?



But who cares, really?





Calley pear has a high gene flow, high number of alleles, high number of private alleles, and a high genetic diversity = very invasive









Birds!



>95% of all birds
depend on insects
to raise their young

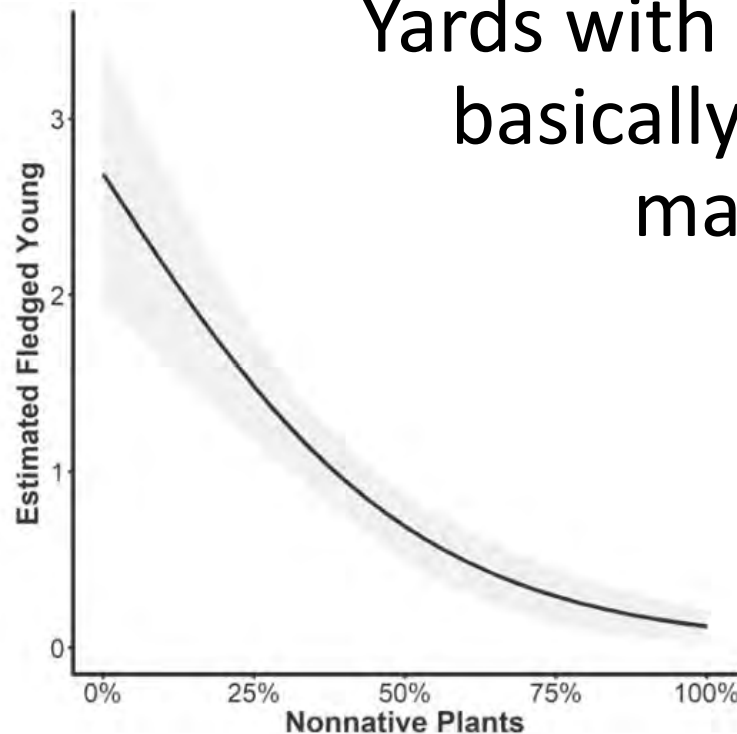
Birds eat a lot

It takes 6,000 – 9,000 caterpillars to raise a clutch of chickadees



Nonnative plants = no insects

More baby birds

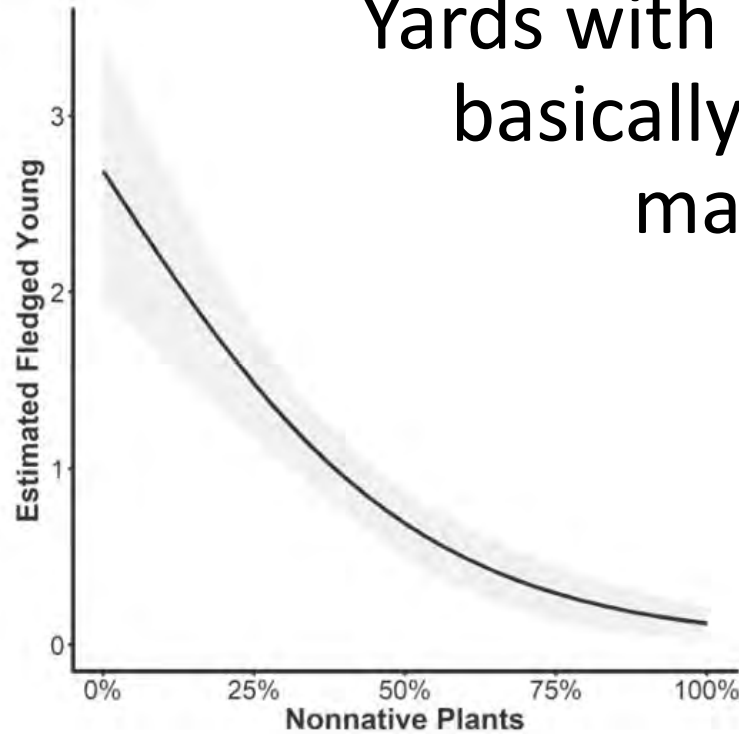


Yards with nonnative plants are basically “food deserts” to many songbirds

More nonnative plants

No insects = no birds

More baby birds



Yards with nonnative plants are basically “food deserts” to many songbirds

More nonnative plants

What to do now?

Figure out how to
manage (kill) it, obviously.

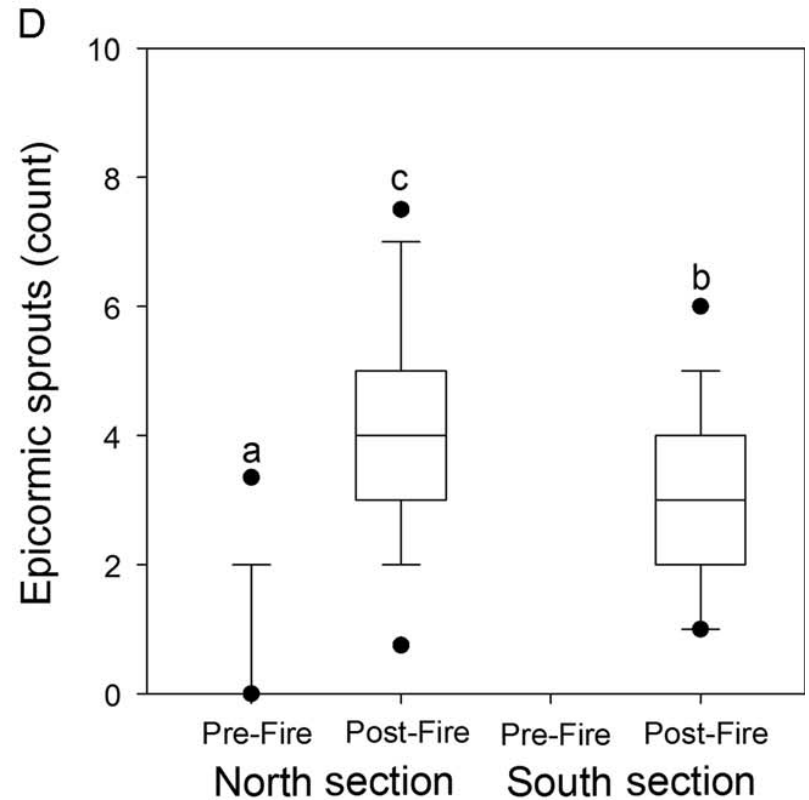
What to do?

- Kill it with fire?



What to do?

- Top kill, yes
 - But you'll just make it angry
- Averaged 4 resprouts per stem post-fire



What to do?

- Biocontrol?
- From Dr. Doug Tallamy, Univ. Delaware:
 - White oak: 233 caterpillars, 15 species
 - Black cherry: 53 caterpillars, 10 species
 - Callery pear: 1 caterpillar, 1 species.
- Almost nothing eats callery pear.

Does anything eat callery pear?

- Here are all the insects I've seen eating callery pear:

1. Aphids



Does anything eat callery pear?

- Here are all the insects I've seen eating callery pear:

2. Thrips, maybe?



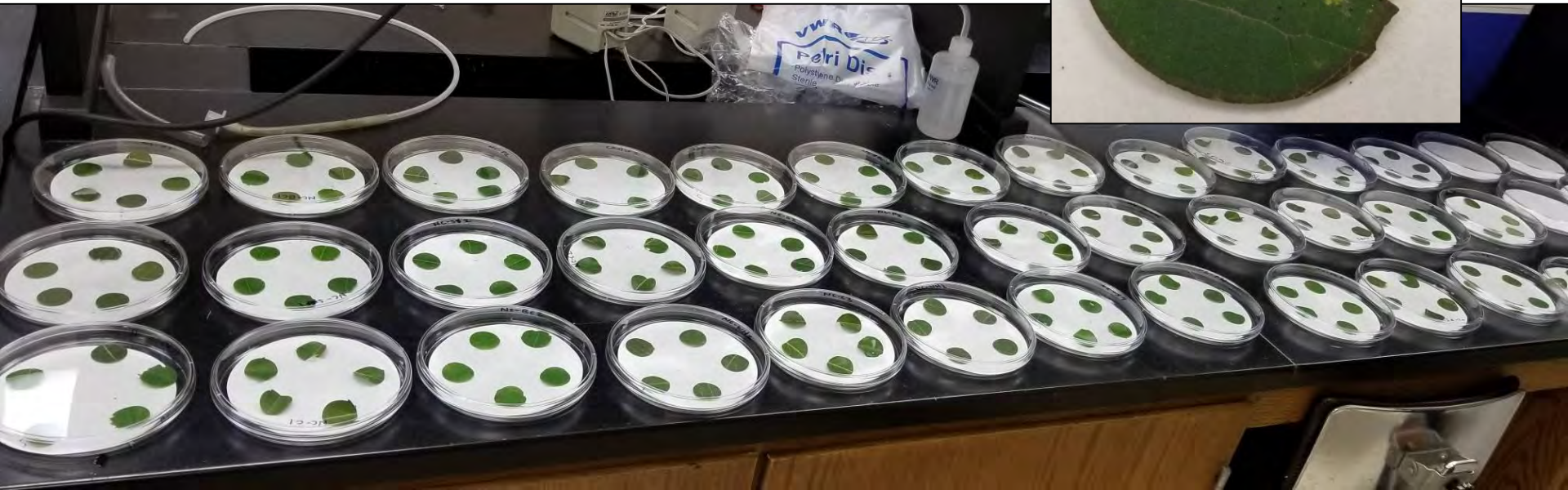
Does anything eat callery pear?

- Here are all the insects I've seen eating callery pear:

3.

Does anything eat callery pear?

- What about generalist insects?
 - Fall webworm
 - Forest tent caterpillar
 - Fall cankerworm



What to do?

- Cut it down!

Whoooooooooah
we're halfway
there...



- Herbicide is a MUST!

What to do?

- Cut it down!
- Spray it later?



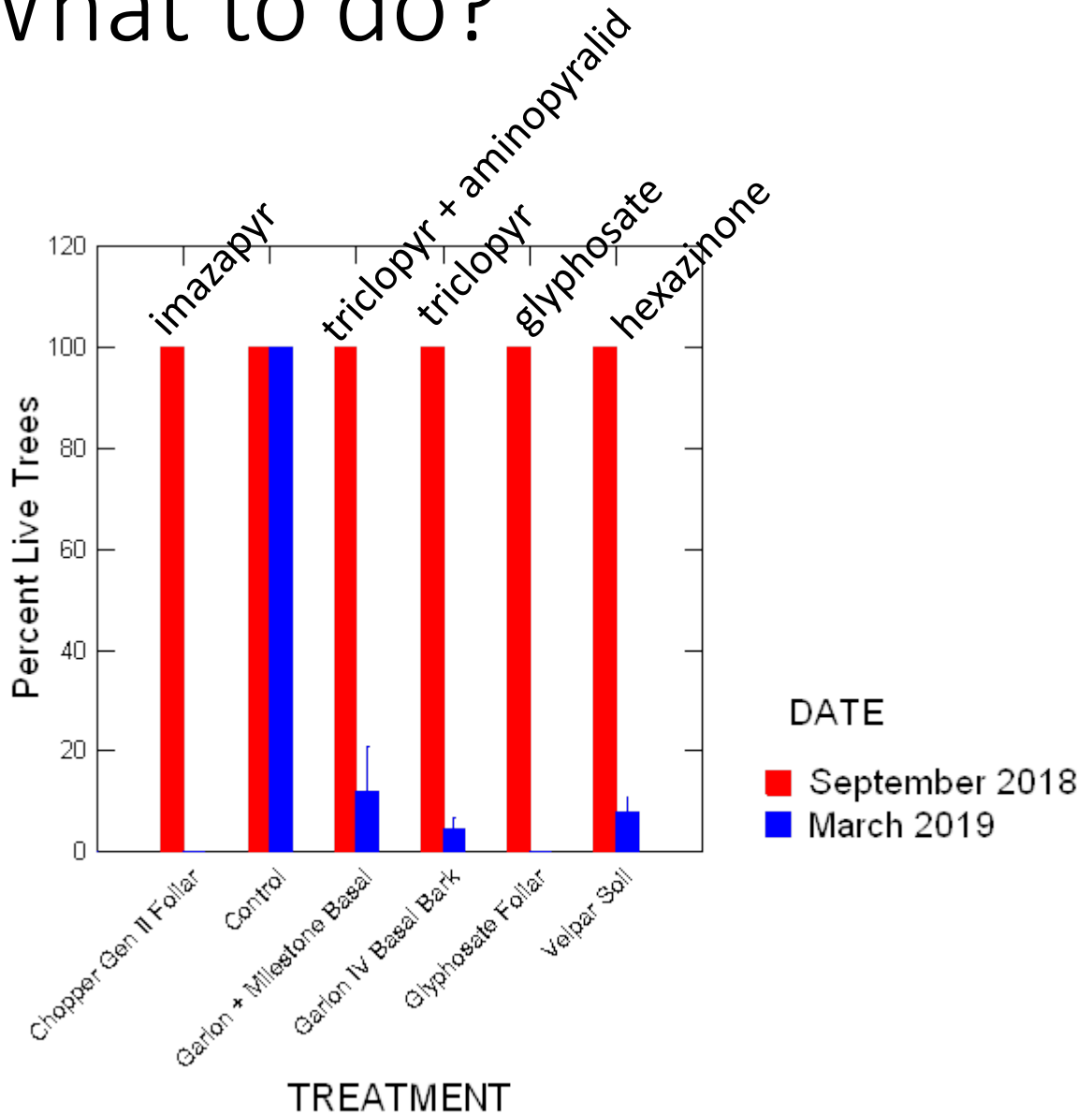
What to do?

- Just spray it?



What to do?

- Herbicides
 - They work!



Questions with control techniques

- Lots of anecdotal information
 - Few replicated studies
 - Sharing is caring...
- Optimal timing for each AI?
- Impacts of tree size on AI efficacy?
- Integrated pest management program?
 - Fire + herbicides?
 - Timing of each?

What to do?

- Community engagement!

Fayetteville foresters ask residents to chop down Bradford pear trees

by Associated Press | Monday, March 25th 2019

AA



What to do?

- Community engagement!



Clemson's Bradford pear bounty program is ON!

The screenshot shows a web browser window displaying the Clemson University website. The address bar shows the URL <https://www.clemson.edu/extension/bradford-pear/>. The page features the Clemson University logo and navigation menus. The main content area is titled "Bradford Pear Bounty" and includes a video player showing a forest scene with a circular logo overlaid. The logo contains the text "BRADFORD PEAR BOUNTY" and "REPLACE REMOVE" with arrows, and is sponsored by Clemson Cooperative Extension, S.C. Forestry Commission, and the City of Clemson. A "Register now" button is visible in the bottom left corner of the page content.

Bradford Pear Bounty

- About flowering pears
- What is 'invasive'?
- Proper Tree Removal
- Tree Planting & Care
- Replacement Trees
- Sponsors & Exhibitors
- Contact Someone

Register now

February 29, 2020 • Nettles Park • 102 Nettles Park Rd. • Clemson, SC

To recap:

- Fire alone does not work
- Herbicides work
- Techniques still need refining

- We know little about other control methods

- What about combinations of fire + herbicide?

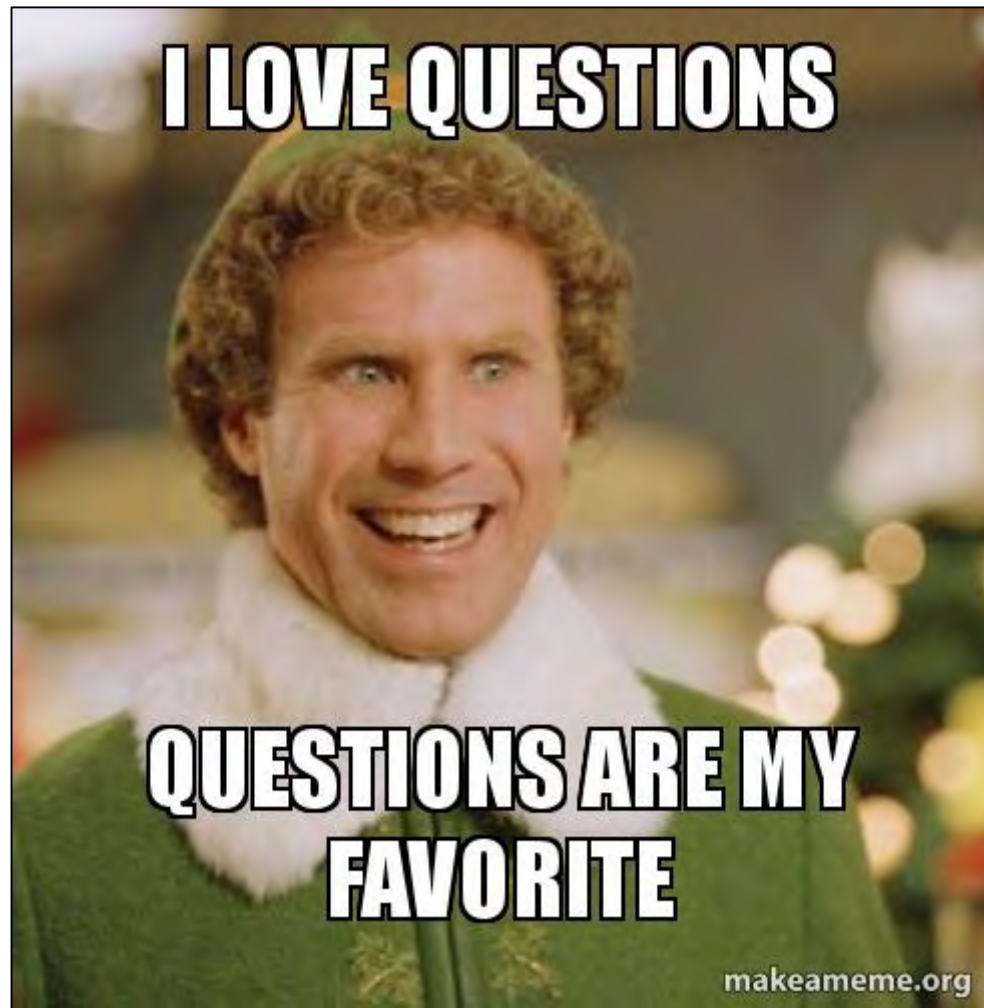
To recap:

- Community engagement
 - Address problem from urban perspective
 - Create awareness
 - There's a MASSIVE disconnect – many people don't know Bradford is related to callery pear...
 - Reduce (stop?) planting of *P. calleryana* cultivars in managed landscapes

Big thanks to all my collaborators!

GEORGIA FORESTRY
COMMISSION





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