

CHESTNUT SPECIES ID: THE BASICS



2012 AMERICAN CHESTNUT SUMMIT
ASHEVILLE, NC



American Chestnut (*Castanea dentata*)



- Member of the *Fagaceae* family
 - Beech (*Fagus*), chestnut (*Castanea*) and oak (*Quercus*)
- Species of *Castanea* native to north America
 - *Castanea dentata* – American chestnut
 - *Castanea pumila* – Chinquapin or Allegheny Chinquapin
 - *Castanea ozarkensis* (*Castanea pumila* var. *ozarkensis*) – Ozark Chinquapin
- Non-native *Castanea* species
 - *Castanea mollissima* – Chinese chestnut
 - *Castanea crenata* – Japanese chestnut
 - *Castanea sativa* – European chestnut
 - *Castanea henryi* – Henry’s chinquapin (China)
 - *Castanea seguinii* – Seguin chestnut (China)

Chestnut Species You Might Find:



- Native:
 - American chestnut (3 nuts/bur)
 - Allegheny chinquapin (1 nut/bur)
- Imported (with recorded dates):
 - European chestnut (1773)
 - Japanese chestnut (1876)
 - Chinese chestnut (1912)
- **HYBRID CHESTNUTS**
 - Hybridizing efforts have been recorded in the US beginning in 1895
 - The Connecticut Agriculture Experiment Station has been breeding chestnuts since the 1920's



American chestnut



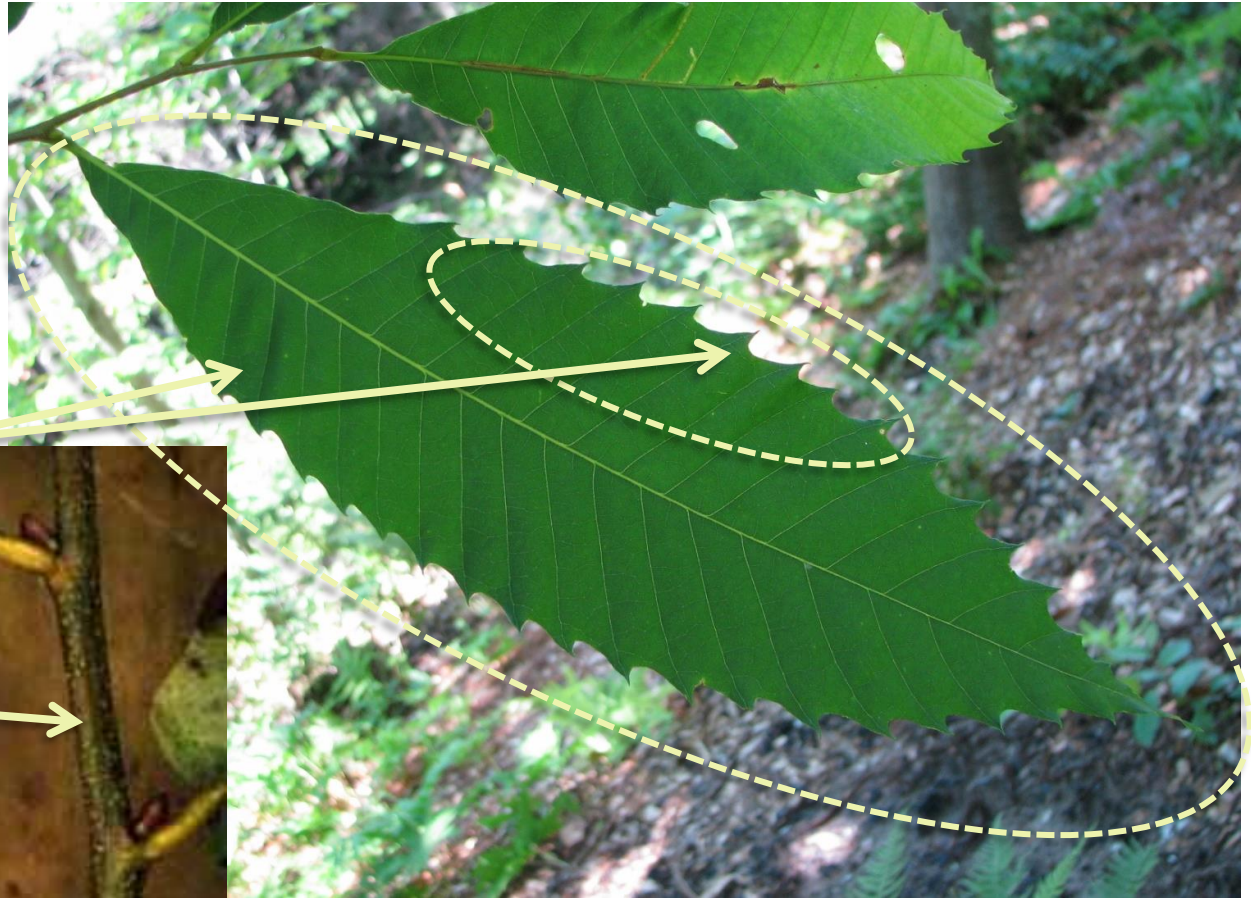
Leaf hairless, except for sparse hairs on veins

Leaf fairly thin and papery

Leaf canoe-shaped with deeply toothed margins

Twig hairless and red to chestnut-brown

Bud smooth, and brown, pointed and usually askew on the twig



American chestnut

Large, timber-form tree (at maturity)

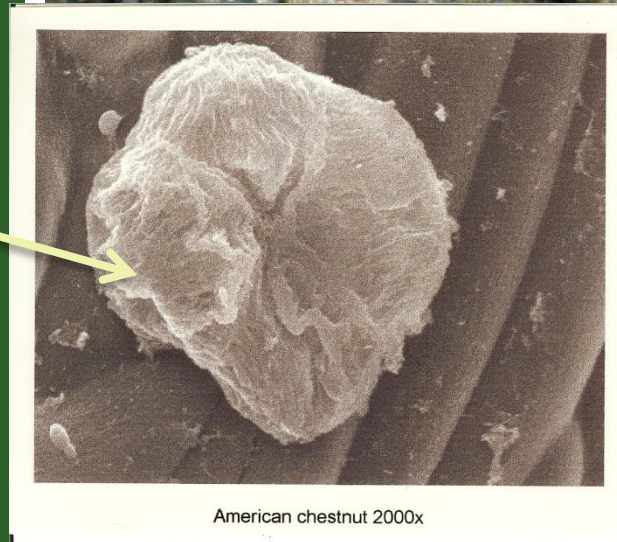
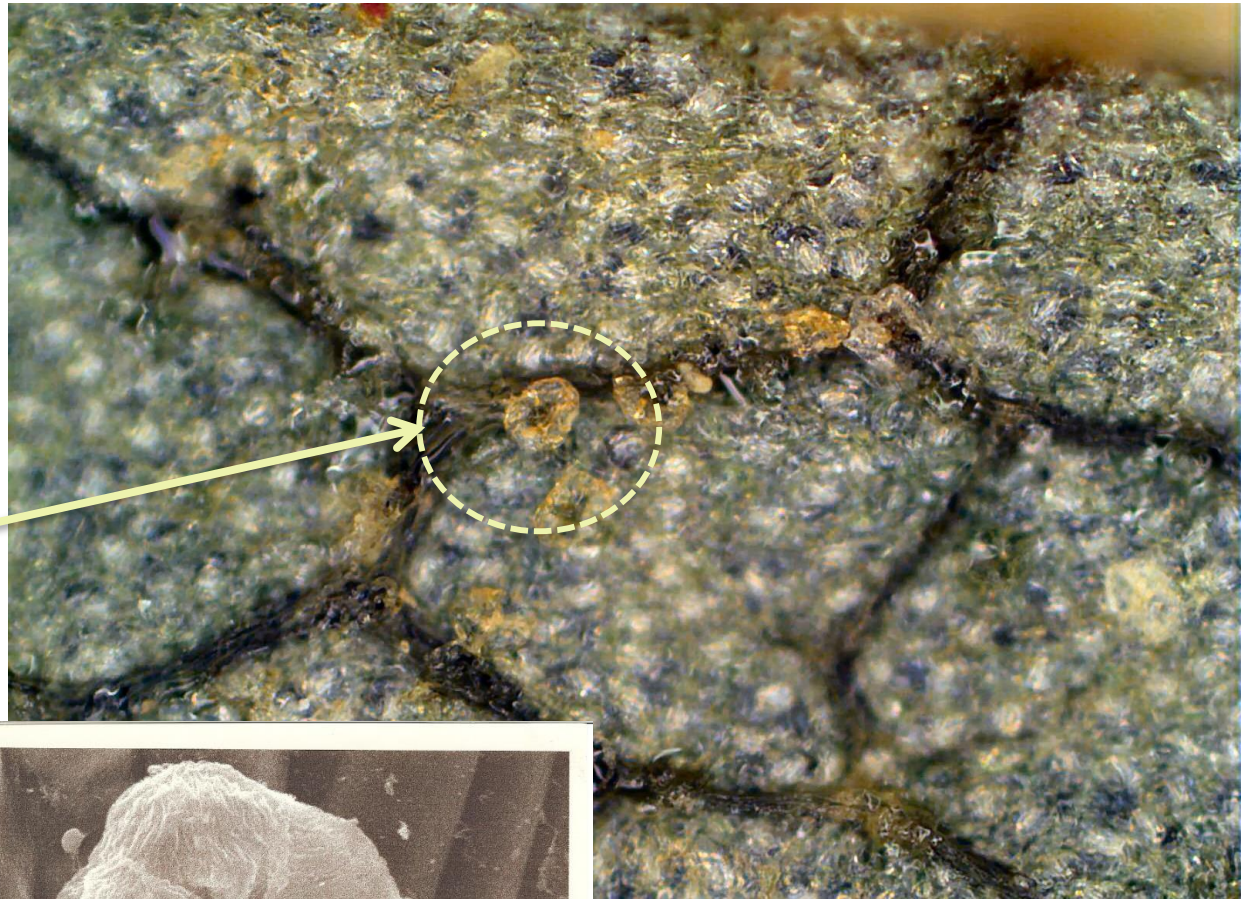


Underside of the
leaf:

No hairs, besides a
few on veins

4-celled glandular
hairs, called
trichomes, on leaf
surface

4-celled American
trichomes have “**hot
cross bun**” shape



American chestnut 2000x

American chestnut



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Leaf **glossy**, usually **hairy** on underside

Leaf **thick**, may be leathery in texture

Leaf **oval** to row-boat shaped with wedge-toothed margins

Twig **pea-green** to tan, new growth **hairy**

Bud **round**, pea-green to tan, **hairy** and in-line with stem



Chinese chestnut
Spreading, orchard-form tree

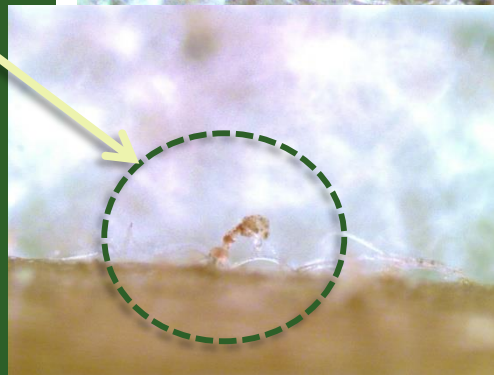




Underside of the leaf:

Sun leaf **very hairy** – both stellate (star-shaped) and simple hairs

Stalked glandular hairs with **prominent heads**, (trichomes) on leaf veins only



Chinese chestnut



Sun leaf glossy,
hairy on underside

Leaf narrow, oval
with blunt base

Bristle-toothed
margins

Twig pinkish-
brown, new
growth hairy



Japanese chestnut
Spreading, orchard-form tree



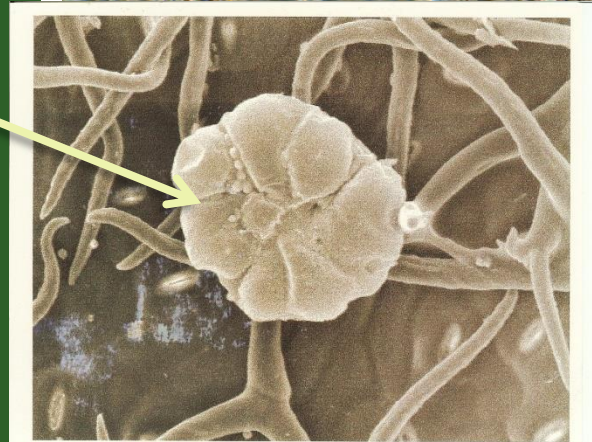
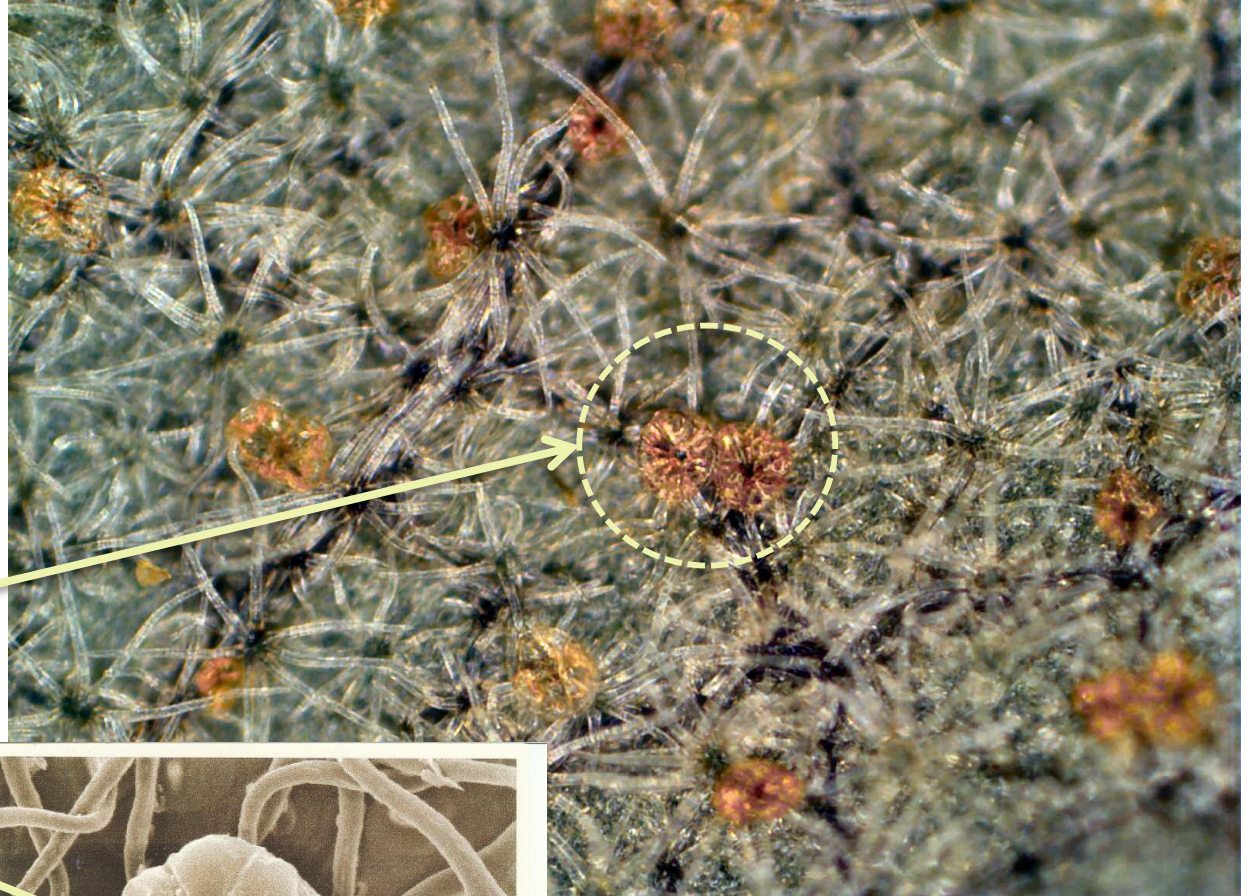


Underside of the leaf:

Sun leaf **hairy** – both stellate (star-shaped) and simple hairs

9-celled glandular hairs (trichomes) on leaf surface

9-celled trichomes **much larger** than American trichomes



Japanese chestnut 1000x

Japanese chestnut





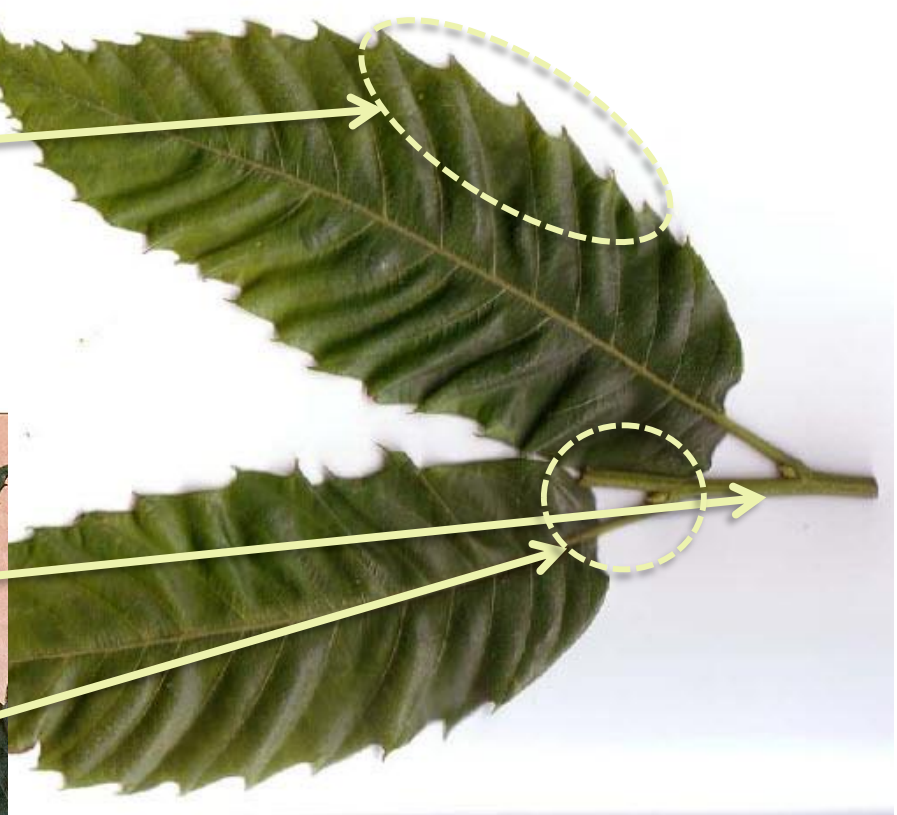
Leaf most similar to American, more triangular leaf margins

Leaf base often rounded, with a long petiole

Leaf underside may be hairy

Twig very thick and coarse, dark brown at maturity

Bud very large, may be reddish



European chestnut
Spreading, orchard-form tree

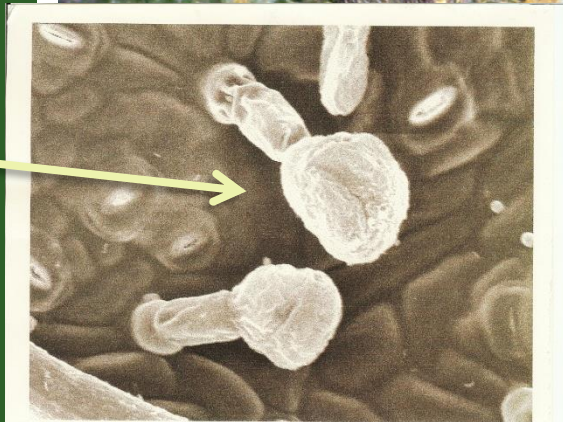
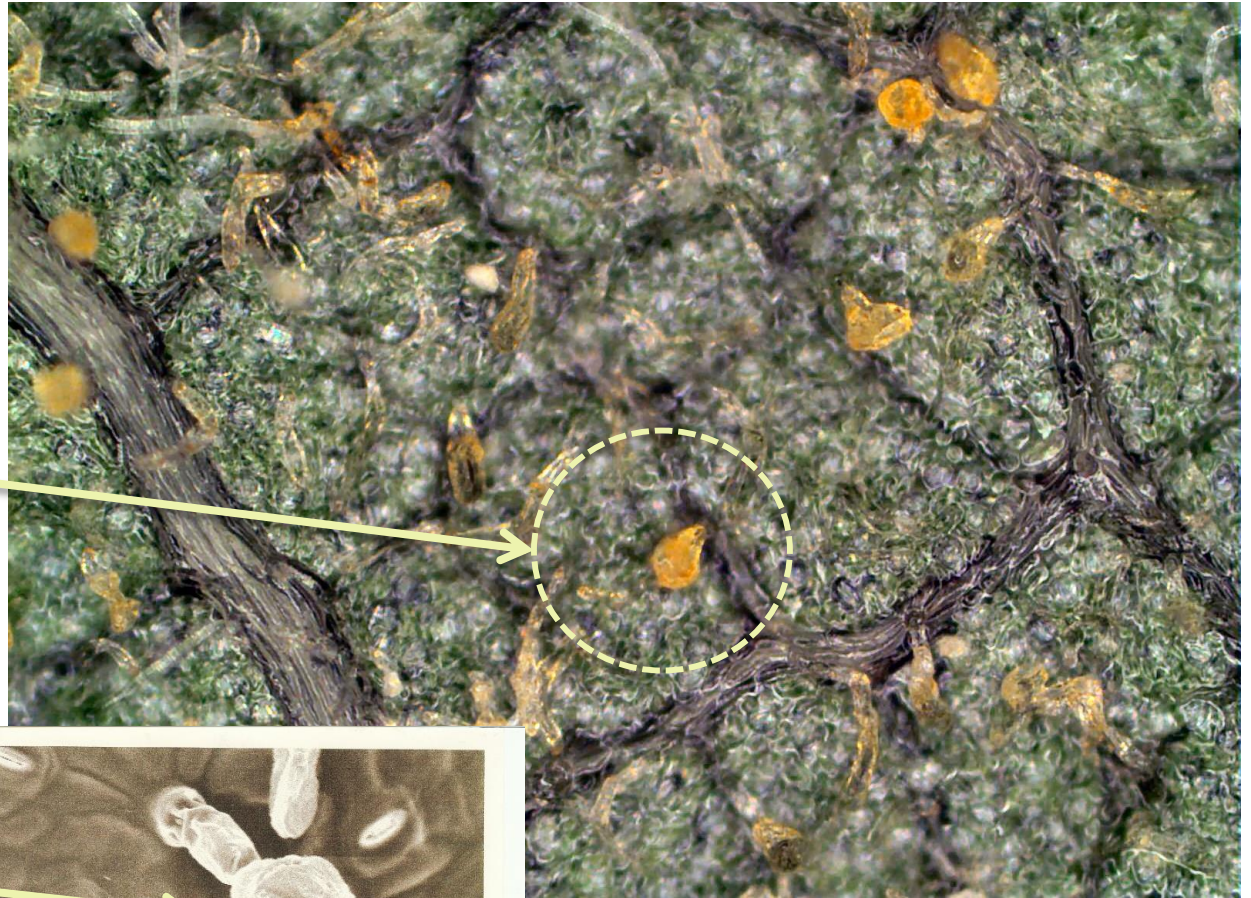


Underside of the leaf:

Vary between very hairy and not hairy

Stalked, club-shaped glandular hairs (trichomes) present, though often **difficult** to see

Stalked trichomes on **leaf surface** and **leaf veins**



European chestnut 1000x

European chestnut



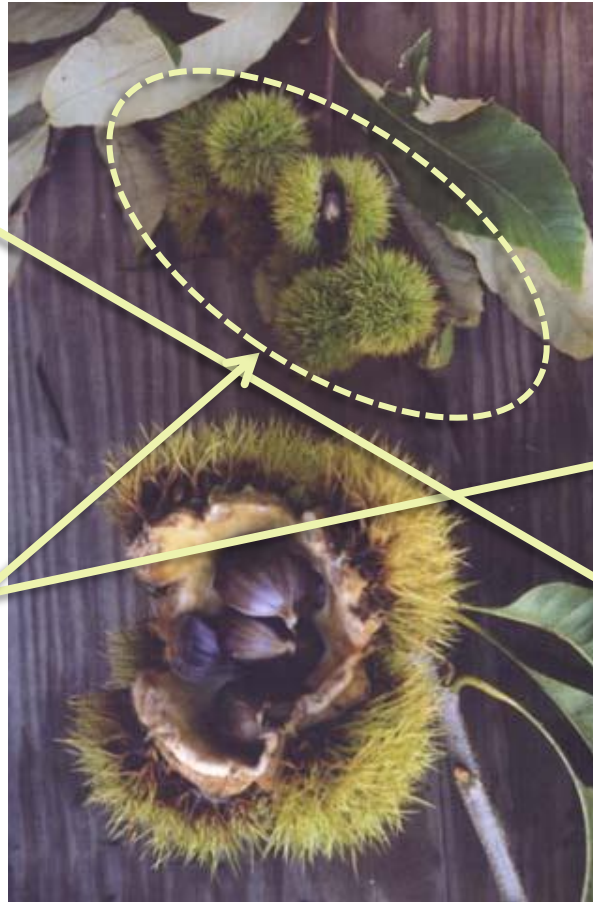
Leaf usually **hairy** on underside

Leaf margins slightly to deeply toothed

One pointed nut per bur, instead of three

Burs form in **clusters**

Burs open in **two parts**, instead of four



Allegheny chinquapin

Shrub or small tree

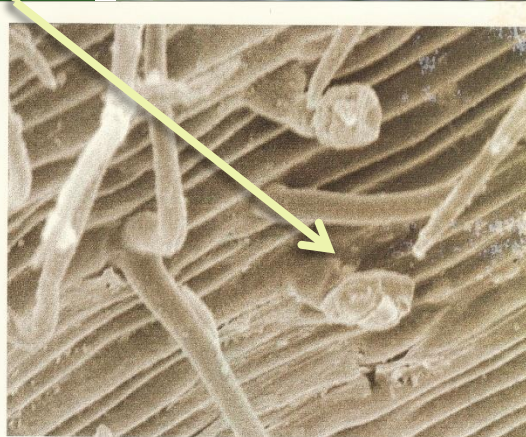
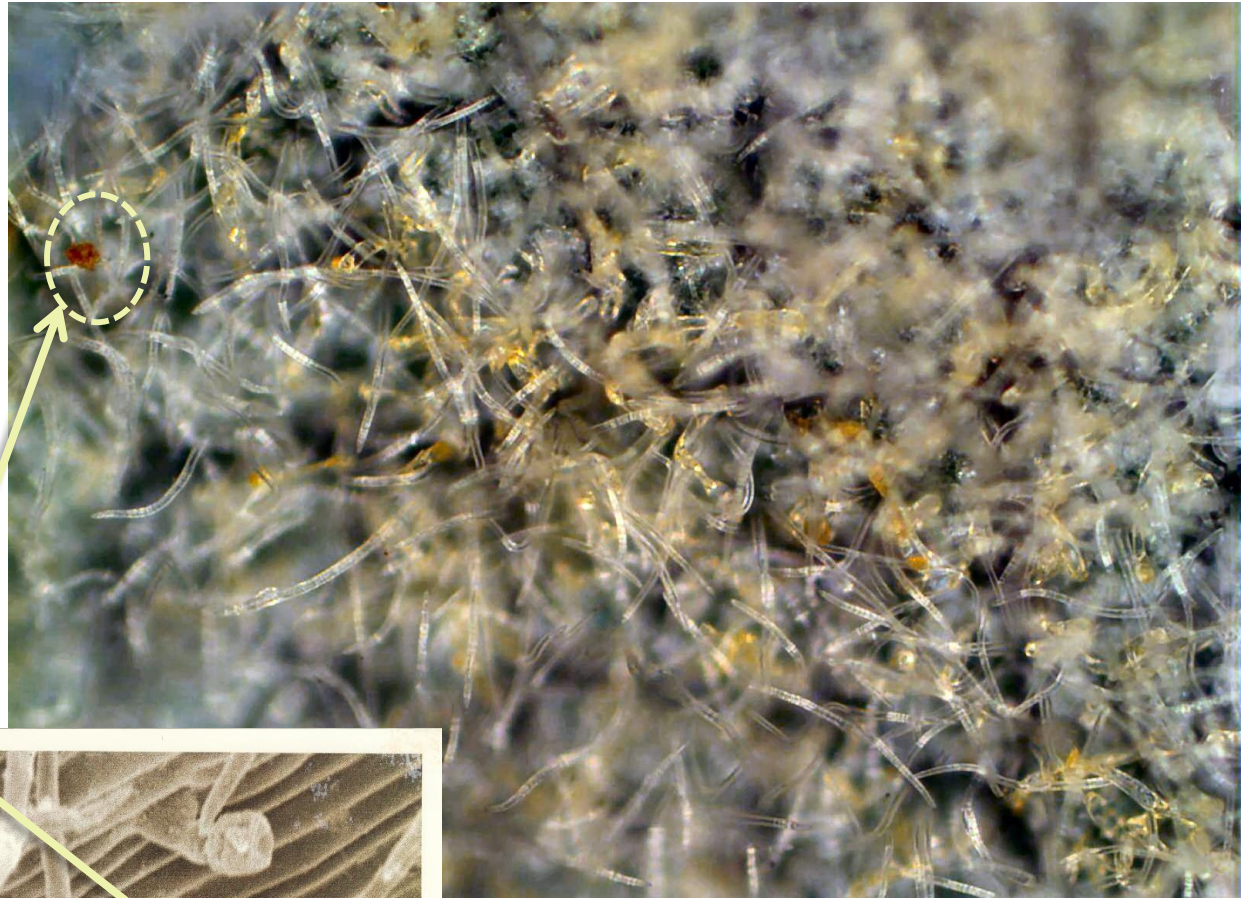


Underside of the leaf:

Sun leaf usually **very hairy**

Both **simple** and **stellate** hairs

Bulbous glandular hairs (trichomes) leaf surface



Chinkapin 1000x

Allegheny chinquapin

Species Comparisson



Top side of leaves:

Underside of leaves:



Top row: Allegheny chinquapin

Bottom row: American, Chinese, European and Japanese chestnuts



Top and Side Views of Chestnuts.

From Left:
American, Chinese,
Japanese, and
European



Species Comparison: Nuts



Photo Credits

Thank you to all who provided images for this presentation!

- All microscopic images were taken/provided by Stephen Baumann, Tim Eck and Dave Armstrong
- All SEM images were taken by Tracey Coulter, with support from the WISER grant program
- Species comparison images, as well as Allegheny chinquapin images, were taken by Dr. Paul Sisco
- The larger European chestnut image was taken by Dave Armstrong
- All other images were taken by TACF staff

