Storm Effects on Trees and Forests: *It depends*

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After storm damage from wind or ice the question commonly asked is:

Will my trees survive ?

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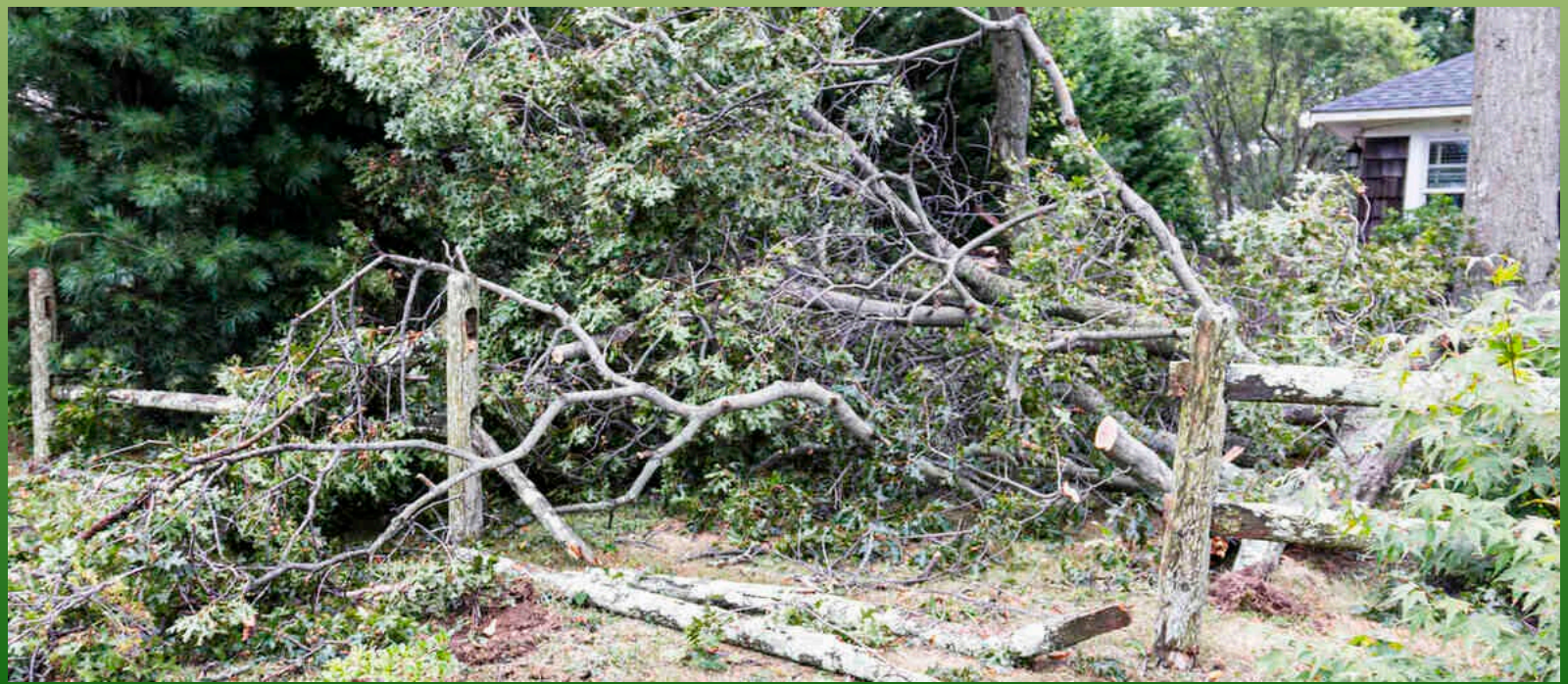
This question takes center stage because of our inherent, native urge to... “*get this mess cleaned up*.”



My message today is
be patient

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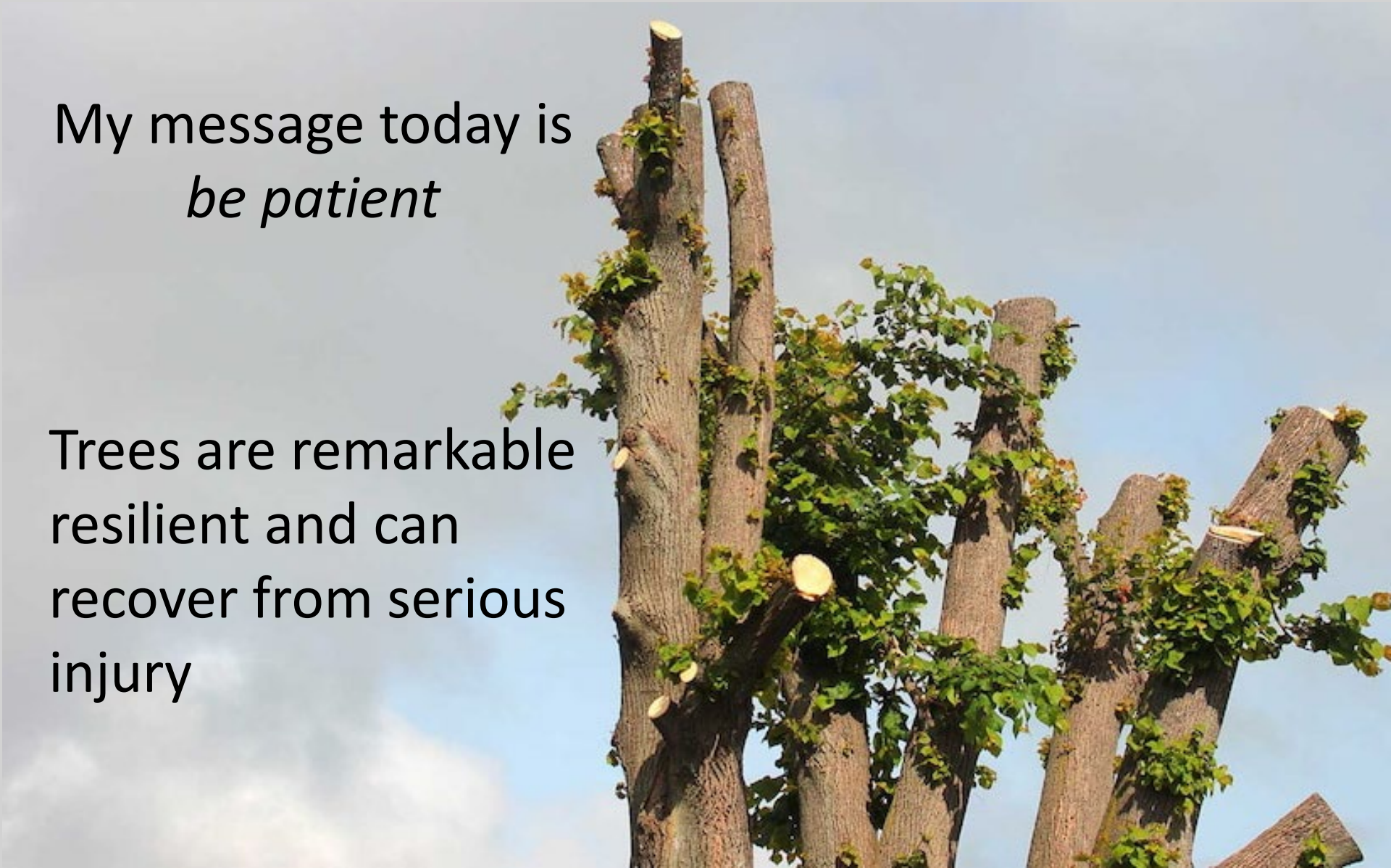
Trees are remarkable resilient and can recover from serious injury



Types of Wind Damage to Trees

Uprooting

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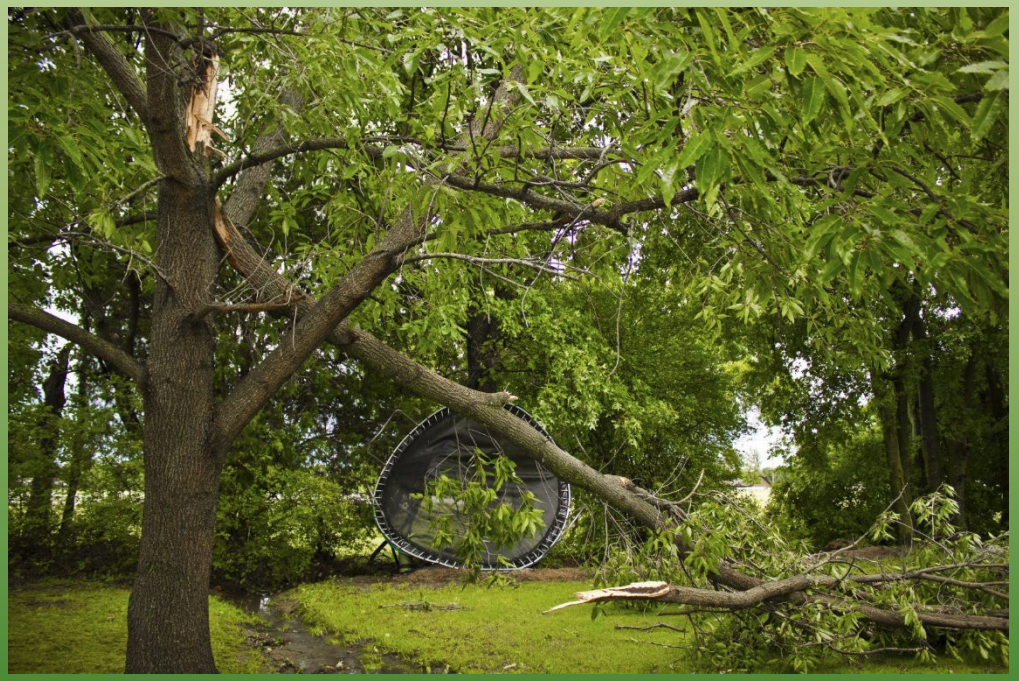
Uprooting

Stem/branch Damage

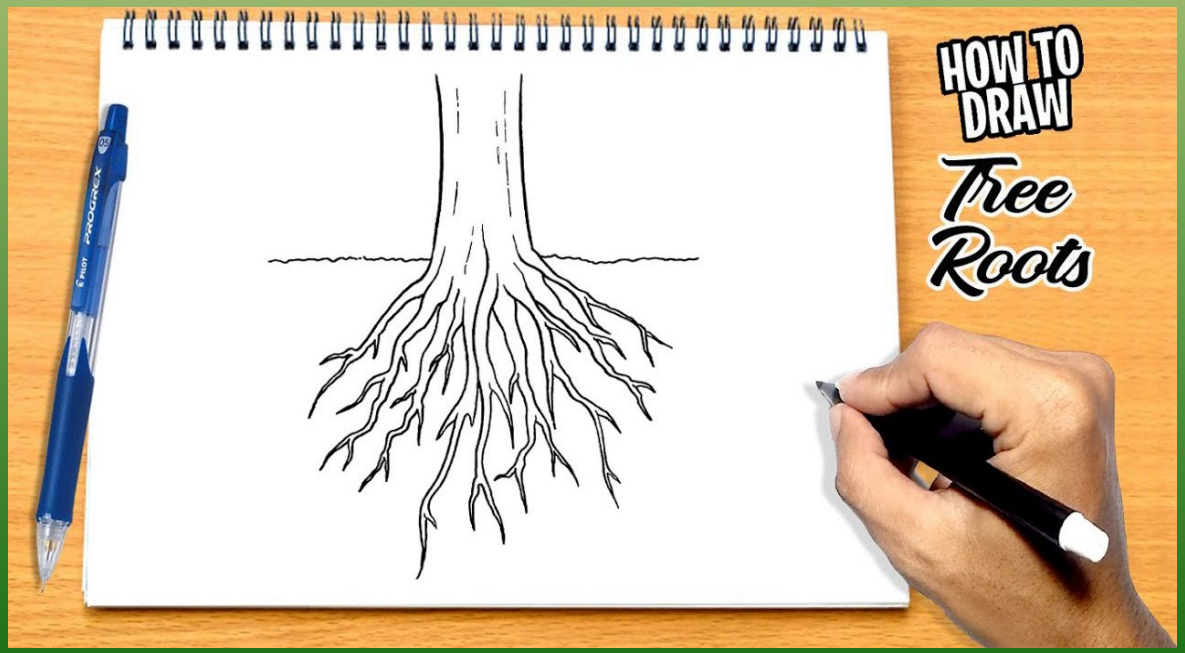


Types of Wind Damage to Trees

Uprooting

Major Functions of Tree Roots

Absorption of water and minerals
Anchorage
Storage of carbohydrates
Chemical signaling to top



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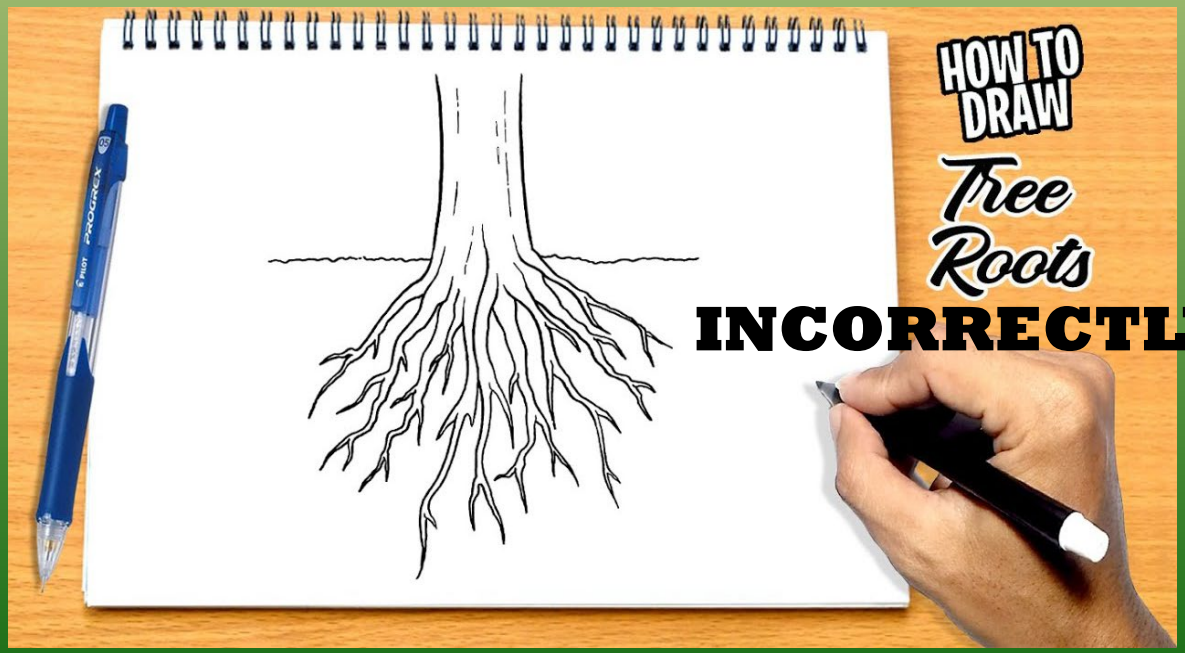
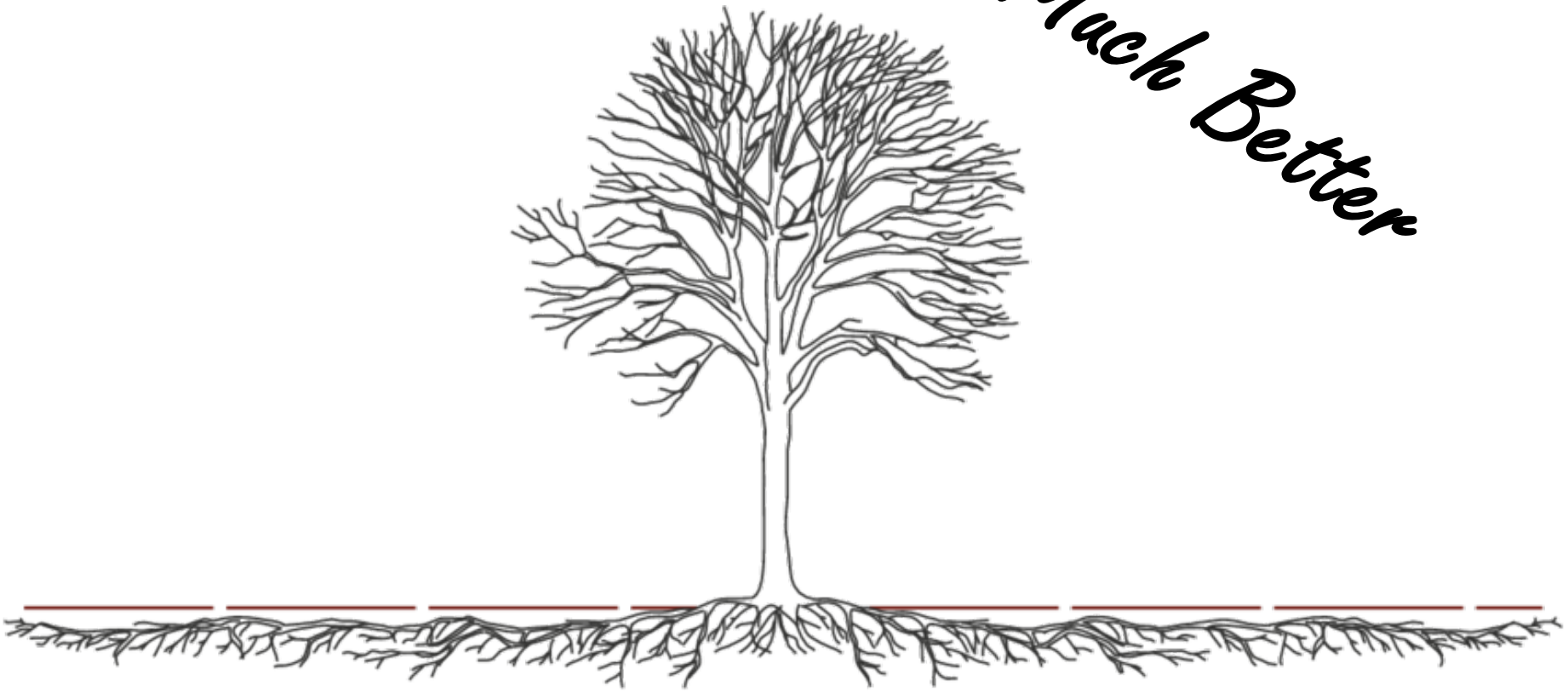
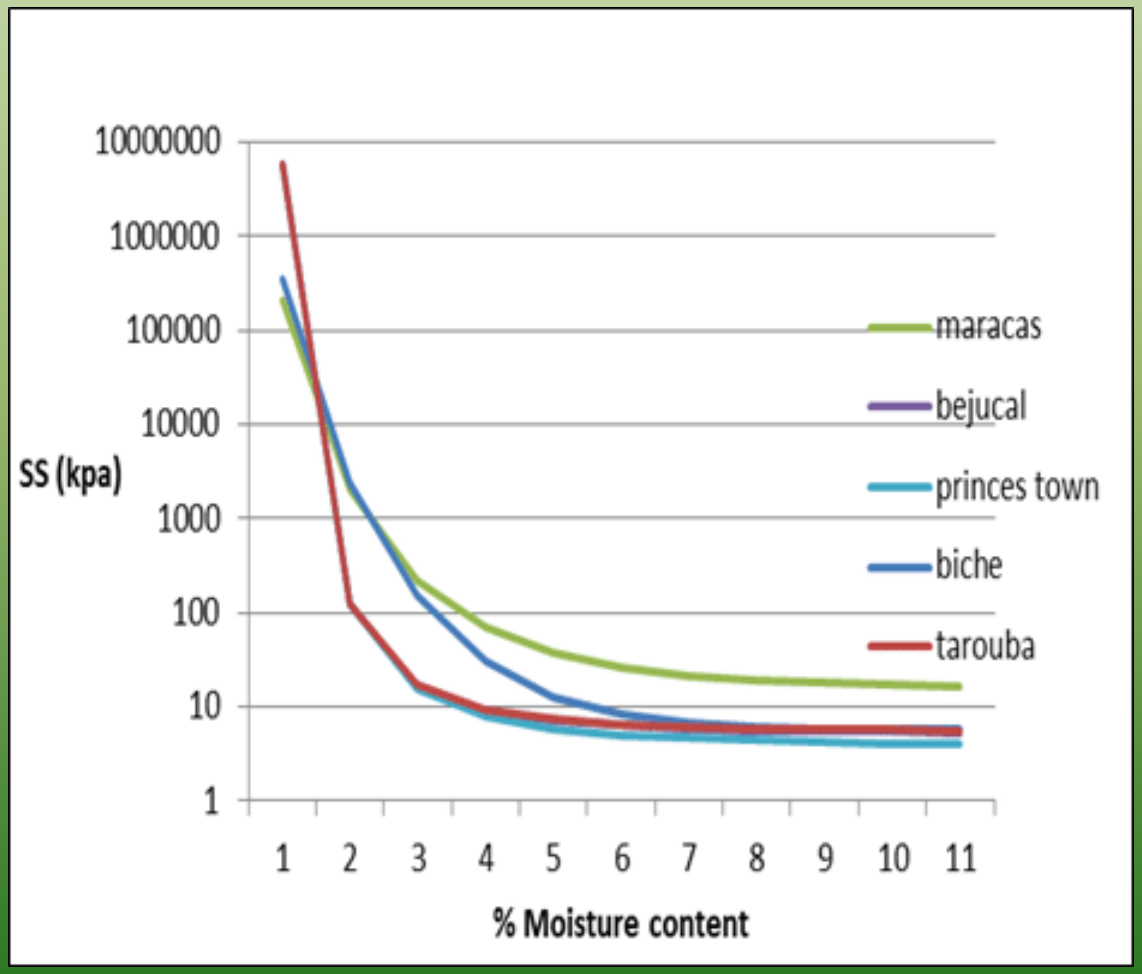



Much Better

Soil strength varies greatly with soil moisture.



Very old white oak with a severely compromised root system fell during ice storm

Younger trees may even survive a partial uprooting

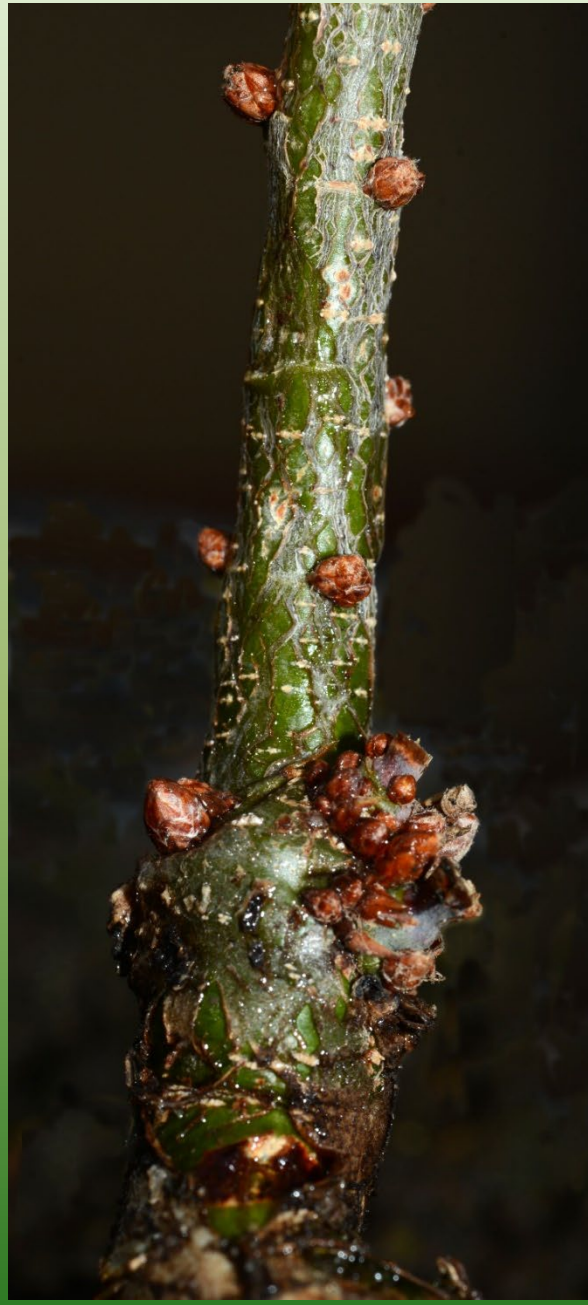
Stem and Branch Damage

Trees are remarkable at growing new tops

They do this by the use of “emergency” buds

Emergency Bud Type #1

Latent dormant buds



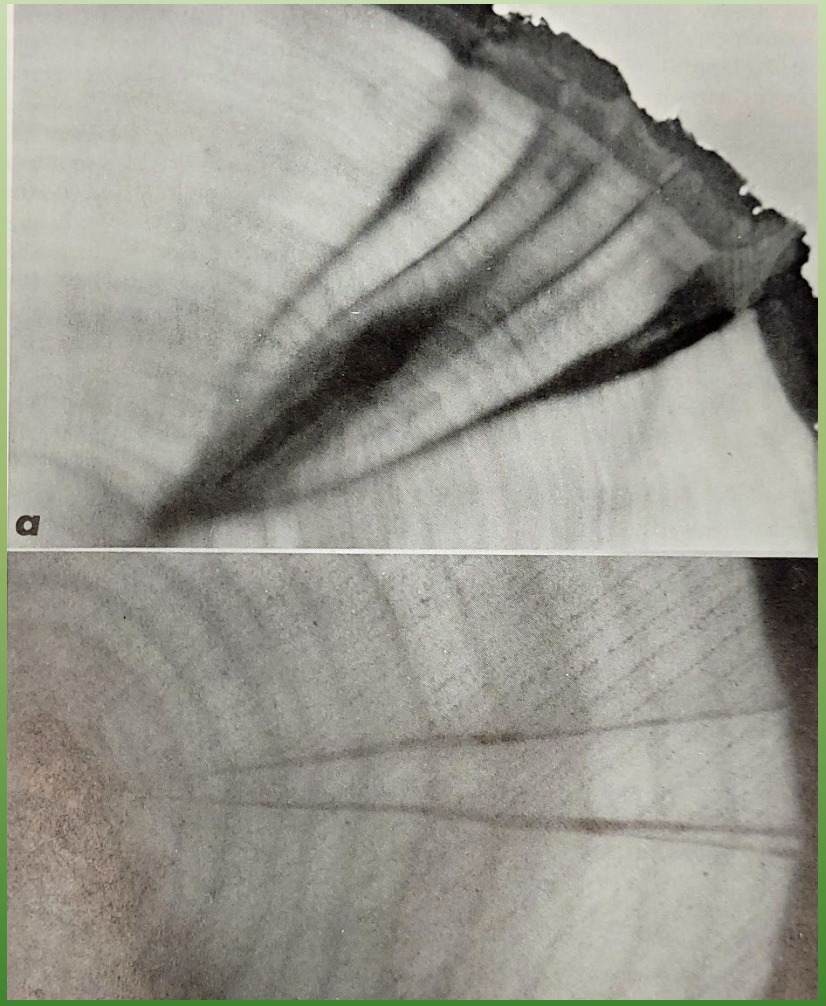
White oak (*Quercus alba*)

Emergency Bud Type #1

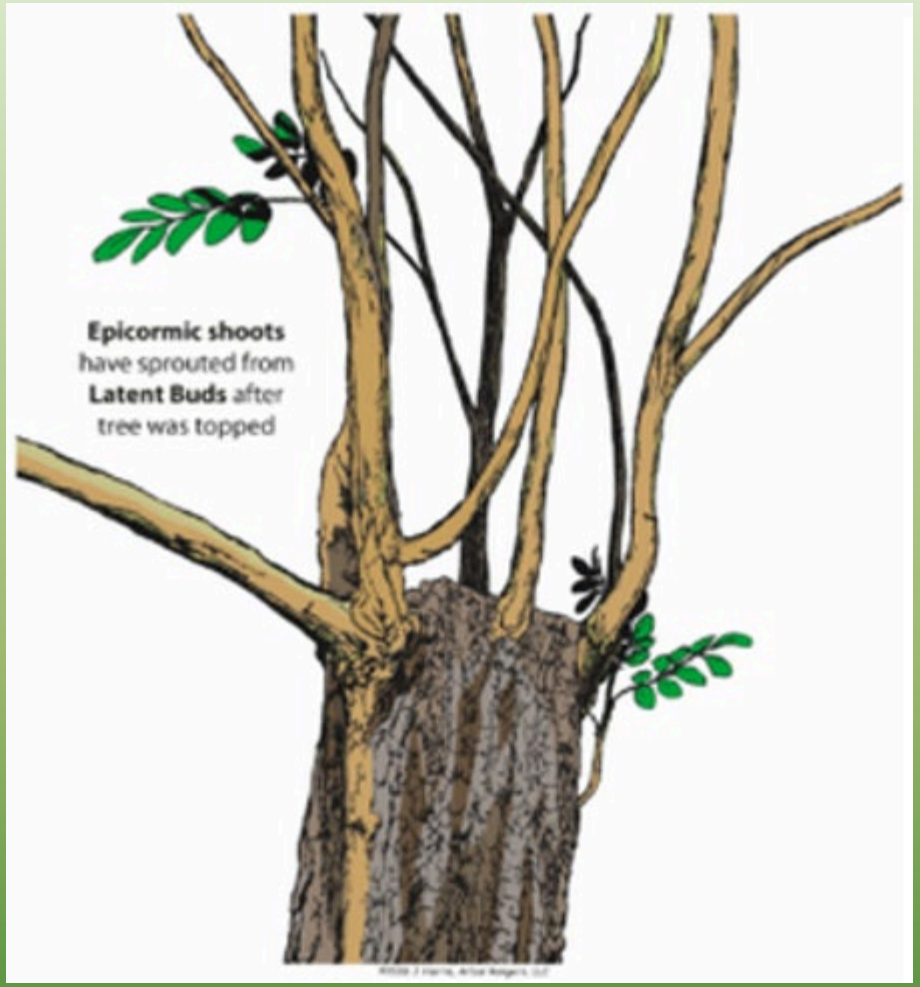
Latent dormant buds

These buds slowly grow with time and stay hidden embedded near the surface of the bark

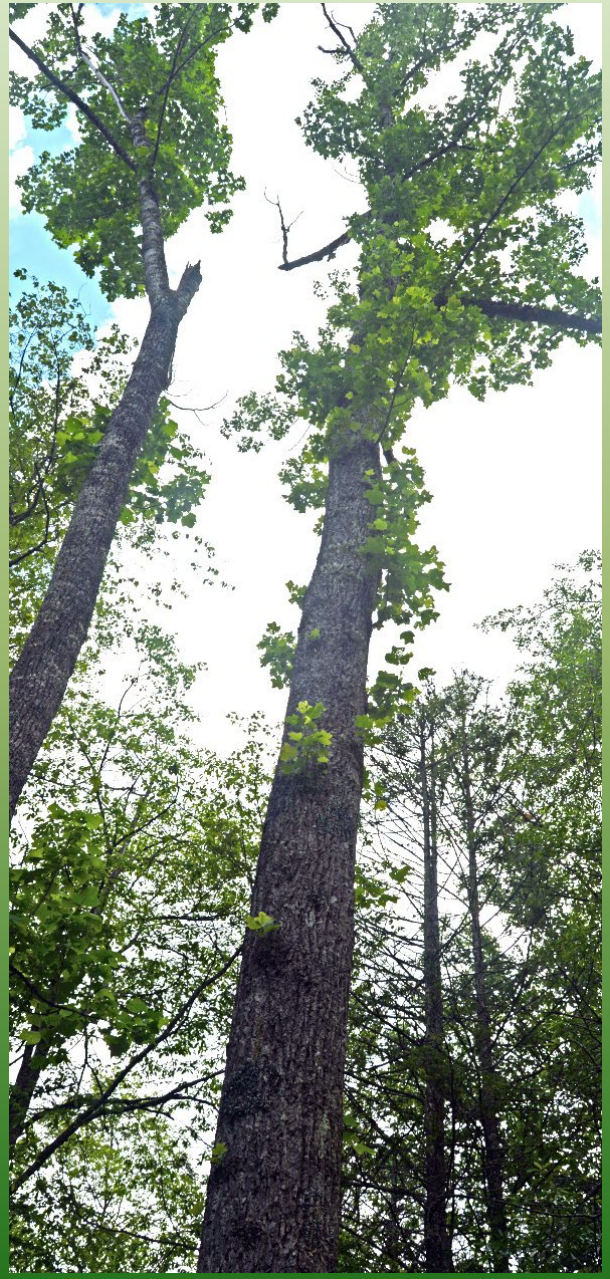
Chemical “signals” from the top keep the buds from developing normally



Trees can use **latent dormant buds** to grow new tops following large branch death



New shoots emerging from **latent dormant buds** on an American elm



Epicormic branching is also caused by **latent dormant buds**

Stump Sprouts from **latent dormant buds**

The probability for resprouting decreases with age and growth rate

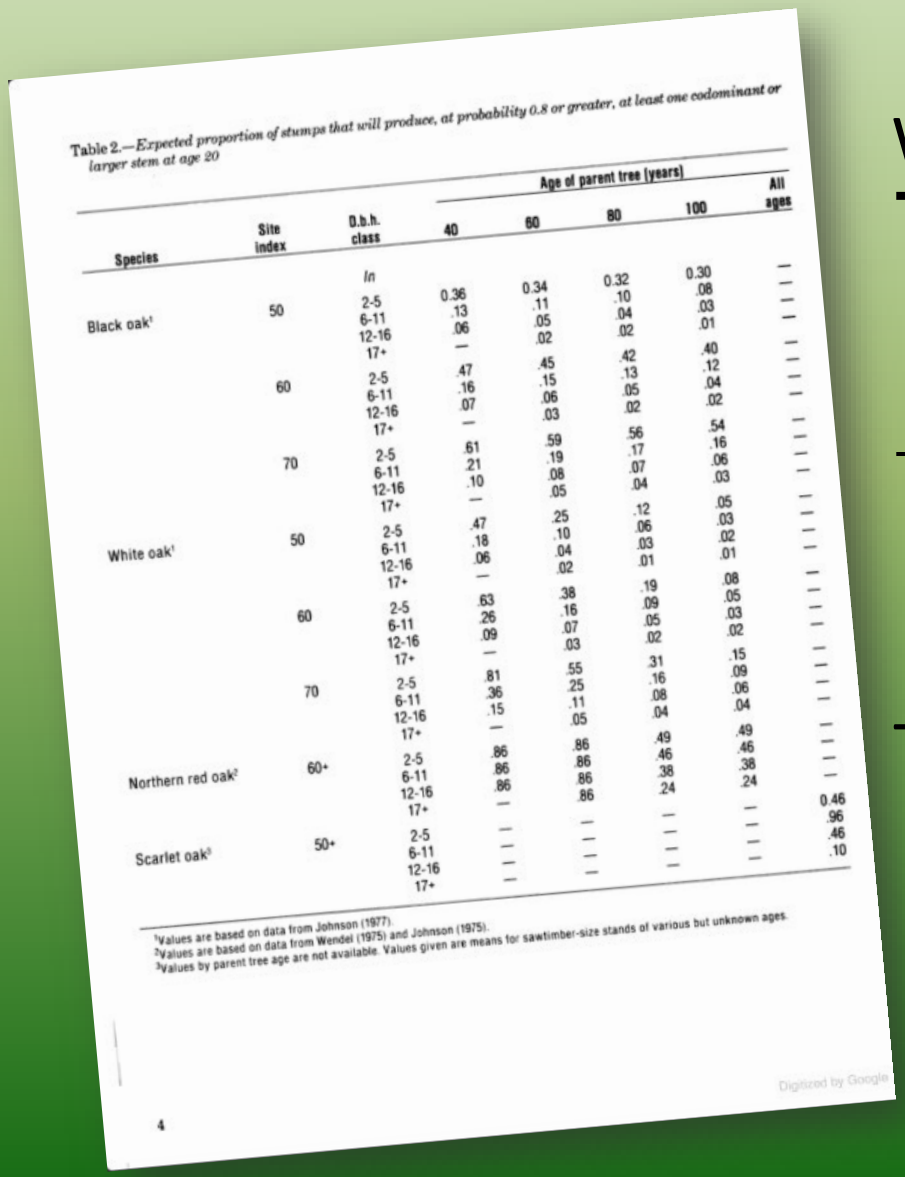


Table 2.—*Expected proportion of stumps that will produce, at probability 0.8 or greater, at least one codominant or larger stem at age 20*

Species	Site index	D.b.h. class	Age of parent tree (years) 40	60	80	100	All ages
		In					
Black oak[1]	50	2-5	0.36	0.34	0.32	0.30	—
		6-11	.13	.11	.10	.08	—
		12-16	.06	.05	.04	.03	—
		17+	—	.02	.02	.01	—
	60	2-5	.47	.45	.42	.40	—
		6-11	.16	.15	.13	.12	—
		12-16	.07	.06	.05	.04	—
		17+	—	.03	.02	.02	—
	70	2-5	.61	.59	.56	.54	—
		6-11	.21	.19	.17	.16	—
		12-16	.10	.08	.07	.06	—
		17+	—	.05	.04	.03	—
White oak[1]	50	2-5	.47	.25	.12	.05	—
		6-11	.18	.10	.06	.03	—
		12-16	.06	.04	.03	.02	—
		17+	—	.02	.01	.01	—
	60	2-5	.63	.38	.19	.08	—
		6-11	.26	.16	.09	.05	—
		12-16	.09	.07	.05	.03	—
		17+	—	.03	.02	.02	—
	70	2-5	.81	.55	.31	.15	—
		6-11	.36	.25	.16	.09	—
		12-16	.15	.11	.08	.06	—
		17+	—	.05	.04	.04	—
Northern red oak[2]	60+	2-5	.86	.86	.49	.49	—
		6-11	.86	.86	.46	.46	—
		12-16	.86	.86	.38	.38	—
		17+	—	.86	.24	.24	—
Scarlet oak[3]	50+	2-5	—	—	—	—	0.46
		6-11	—	—	—	—	.96
		12-16	—	—	—	—	.46
		17+	—	—	—	—	.10

[1]Values are based on data from Johnson (1977).
[2]Values are based on data from Wendel (1975) and Johnson (1975).
[3]Values by parent tree age are not available. Values given are means for sawtimber-size stands of various but unknown ages.

4

White oak sprout probabilities

40 year old = 81%

100 year old = 15%

40-year-old tree

2 to 5 inch diameter = 81%

+17 inch diameter = 0 %

Sander, I., Johnson, P.S., Rogers, R., 1984. Evaluating oak advance reproduction in the Missouri Ozarks. USDA For. Serv. Res. Pap. NC-251, p. 16.

Common Trees That have Dormant Latent Buds

Most hardwood/broadleaf species:

Oak
Hickory
Yellow-poplar
Red maple
Black cherry
Sourwood
Locust

black oak (*Quercus velutina*)

black locust (*Robinia pseudoacacia*)

Emergency Bud Type #2

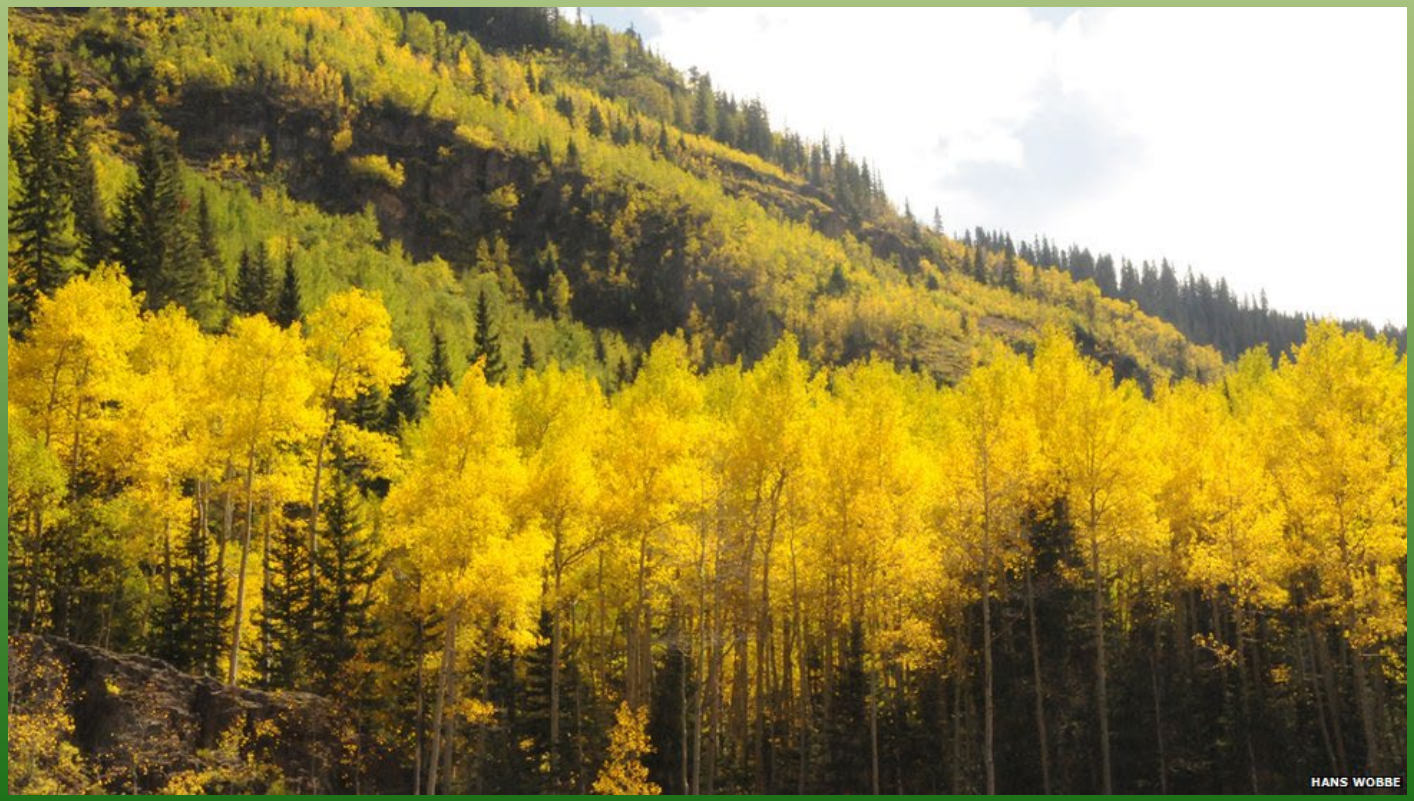
Adventitious buds

Fire cherry (*Prunus pensylvanica*)

Adventitious buds result in what is know as root sucker

'Schubert' chokecherry trees (*Prunus virginiana* 'Schubert') with numerous suckers.
Photo: Tizer Botanic Gardens and Arboretum

The “Pando” colony of Quaking Aspen (*Populus tremuloides*) in Utah, spans 107 acres. Being a **clonal colony created by adventitious buds**, the tree “trunks” all share identical genetic makeup. It is estimated that parts of the inter-connected root stock that links the colony together is in excess of **80,000 years old**!



Common Trees That have adventitious root sprouts

Persimmon
Sassafras
Aspen
Locust
Prunus
Sumacs
Blackgum

Many different pathological problems can also cause or contribute to tree failure

Scarlet oaks are commonly infected with the same pathogen that causes the chestnut blight

SUMMARY

Be Safe! Saws and broken Trees often are bad combinations.
Add a ladder to the mix, and the rest may be history.
It is most often best to get professional help.

Trees are amazing at recovering, often even when left alone, but it may require considerable time.

QUESTIONS ?