



Sweet Outcomes

Tips for Happier, More Resilient Trees

Shelley Lambert / September 2025

Happier, More Resilient Trees

As described by Michael Phillips

To have leaves out in the bright sunshine

To sway with the breeze yet stay firmly rooted

To dance with microbes

To flower, to fruit, to seed

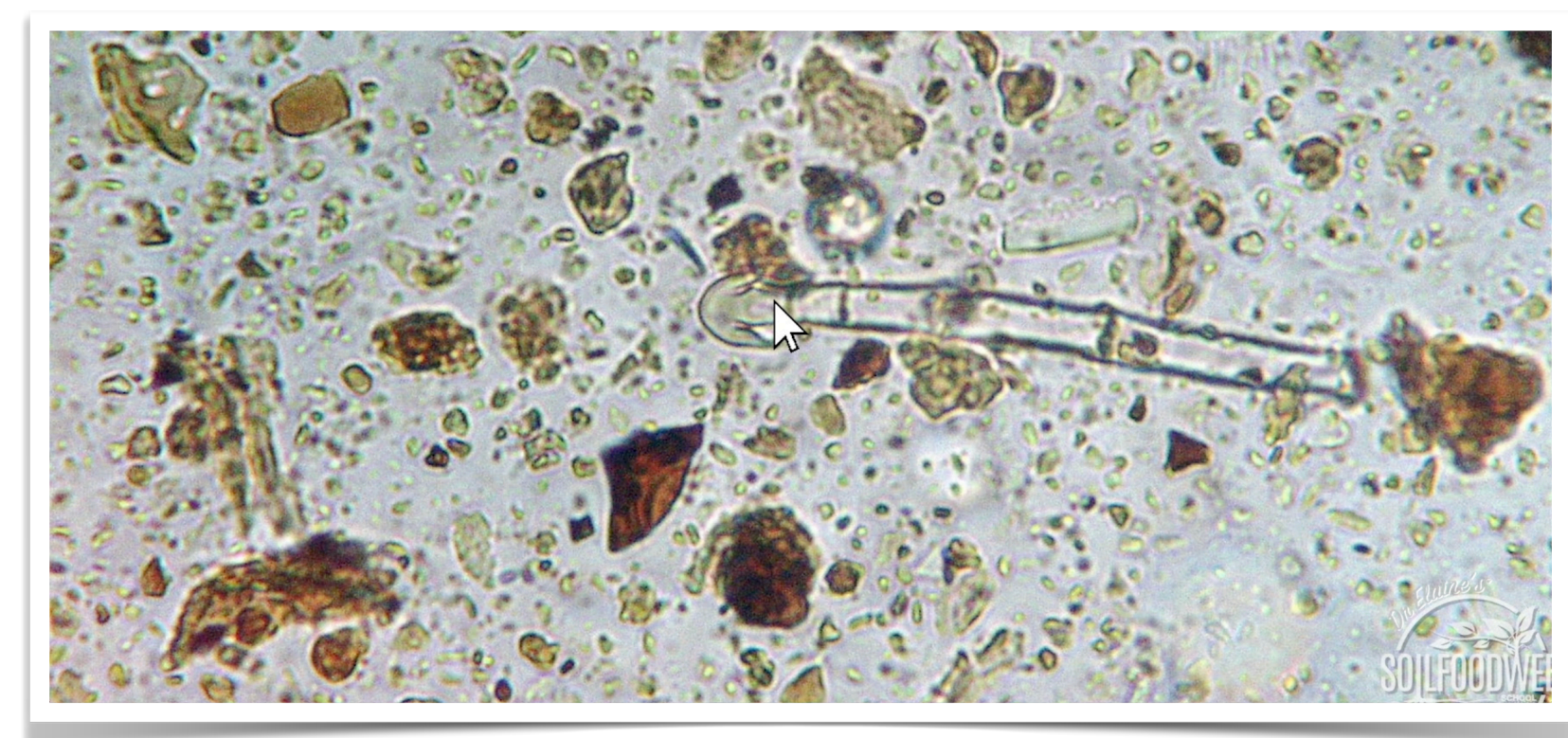
To write sonnets in green



General Principles for Better Outcomes

A short list, analogous to human health

- **Optimize tree growth conditions:** Sunlight, water, soil health & aerobic conditions for healthy roots
- **Feed soil microbes:** Compost and mulch, encourage the 'fungal duff', natural sources of calcium/phosphorus
- **Strategic Application of Food and Care:** Holistic foliar spray, spring compost application, good pruning practices in right seasons
- **Avoid chemicals:** pesticides, fungicides, herbicides kill soil microbes
- **Minimize disturbance:** no till, leave leaf litter (if not diseased), chip and drop pruned branches



Stats that Boggle

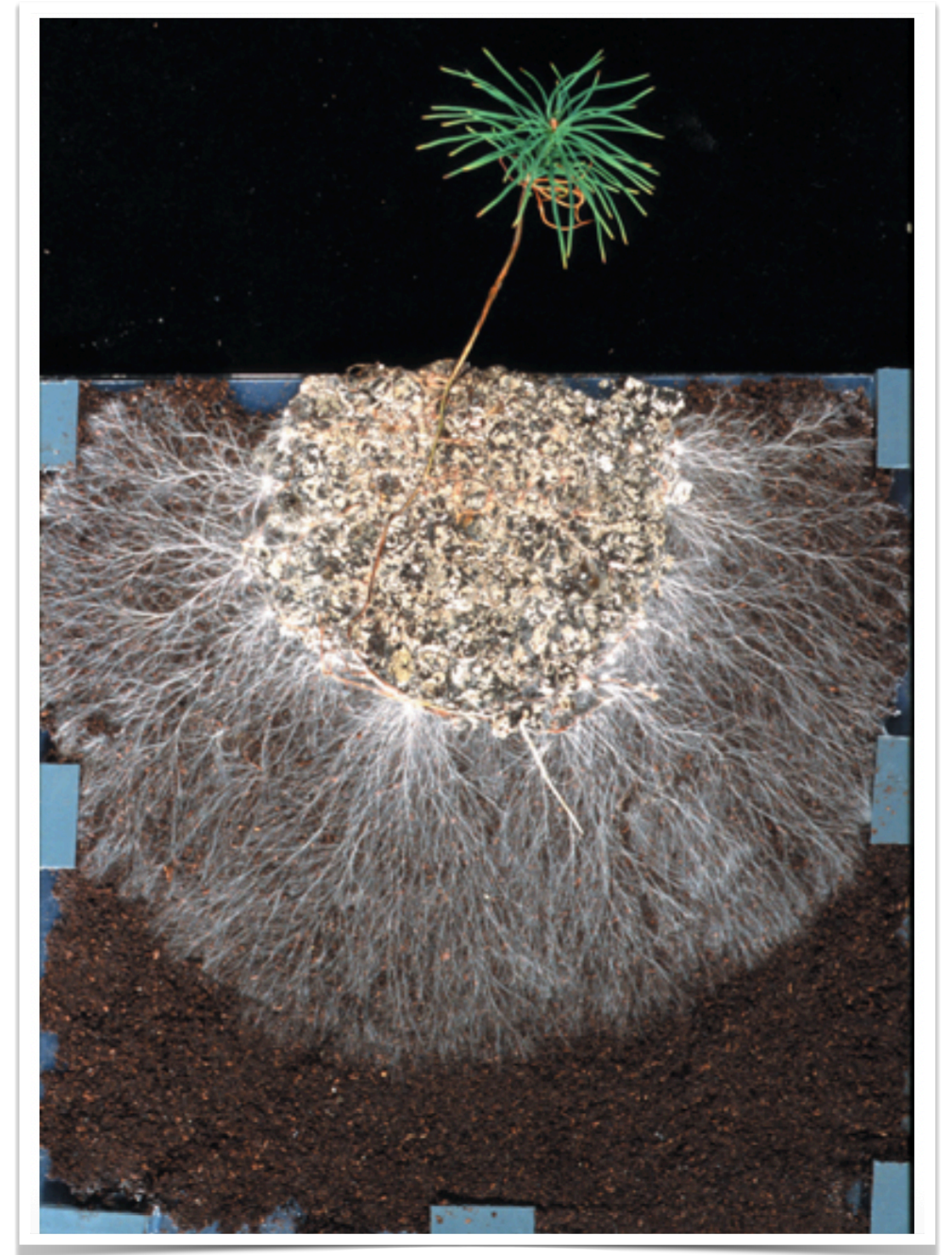
Nerd out on Numbers

- When you walk in a forest, there is typically **450 km** of mycelial network under your footsteps
- **~20%** of the sugars produced by a tree via photosynthesis is given to fungi
- **1 tsp** of healthy soil contains more microbes than there are people on the planet (**billions**) and as many as **10 000** individual species
- Fungal organisms in the soil make it possible for trees to exchange nutrients, water, and information. Information moves at hyper speeds, across kilometres of forest in under **1 second**.
- Average depth of topsoil in urban/suburban Ontario cities is **3 - 12 inches**, can a tree grow there?

Soil Microbes & Trees

Symbiosis Benefits

- **Nutrition** - unlocks phosphorus & trace minerals, gathers nitrogen, increases surface area of roots, more nutrient dense food
- **Seedling survival** rates increase, initiates root growth
- **Plant metabolism** - increased rate of photosynthesis, reserve energy, and systemic resistance
- **Field benefits** - Stabilizes soil, sequesters carbon, water delivery system, deeper roots, suppresses pathogens, breaks up compaction, improves high temperature tolerance, plant-to-plant comms



Practical Ways of Boosting Symbiosis

Increase Interactions with Beneficial Microbes

- Source **air-pruned tree stock** (more roots to start with)
- Use **best tree planting practices** (adequate sun, free roots, not too deep, avoid tea cup effect, water to settle soil)
- Improve & **care for soil** (hugelkultur, Miyawaki, compost, EM, aeration, biochar)
- Apply **mycorrhizal inoculant** (identifiable brands Myke, Root Rescue)
- **Compost** (yearly spring application)
- Woody **mulch**, or mulch mixed with saprophytic mushrooms (wine caps, decomposers that make food for microbes!)



See the Difference

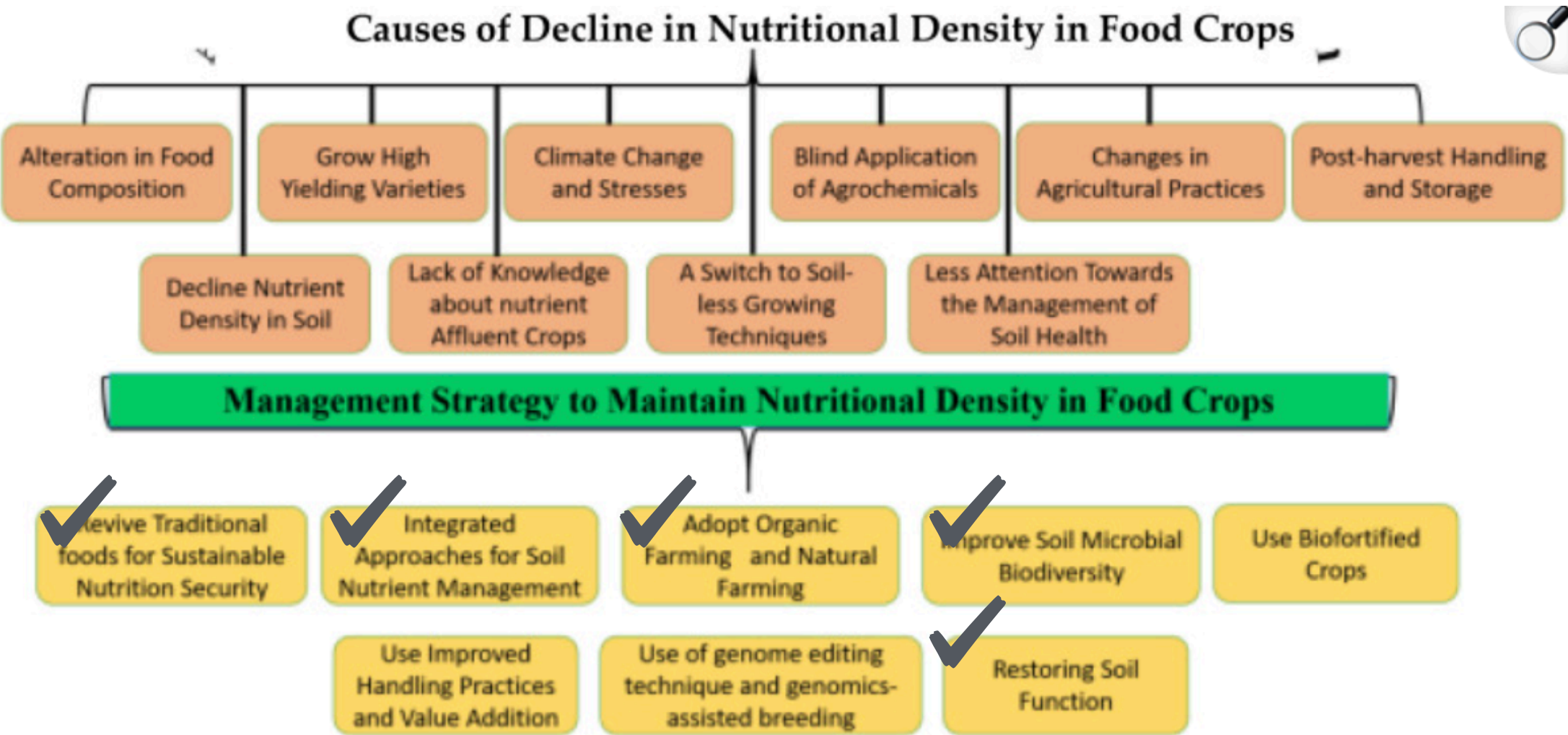
Soil & Tree roots



Taste the Difference

Is fruit really better & more nutritious

- Studies show nutrient decline
- One of the principal causes of the nutrient decline is the degradation of the soil in which crops are grown
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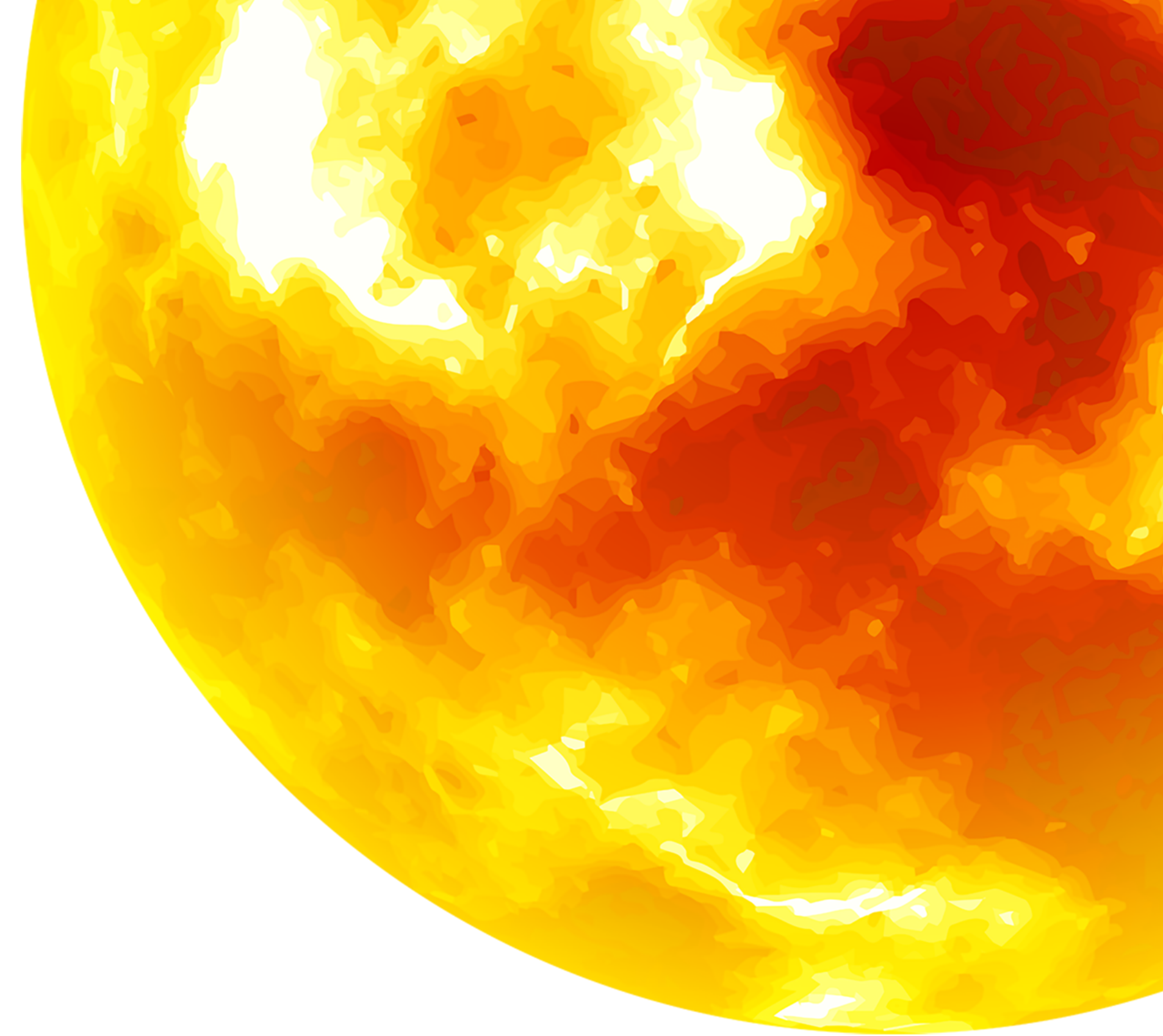
Nutrients' decline trend (%) in different fruits* and vegetables* during 1975 to 1997.
* Based on 100-gram edible portion. Source: USDA food composition tables.

Fruits	Calcium	Iron	Vitamin A (IU)	Vitamin C
Apples (mg)	None	40.00	41.10	Up 42.50
Apricots (mg)	17.70	Up 8.00	3.30	None
Banana (mg)	25.00	55.70	57.40	9.00
Cherries (mg)	31.80	2.50	Up 94.60	30.00
Grapefruits (mg)	25.00	85.00	87.50	12.40
Lemons (mg)	57.40	14.30	3.30	31.20
Orange (mg)	2.40	75.00	Up 2.50	Up 6.40
Peaches (mg)	44.40	78.00	59.80	5.70
Pineapples (mg)	58.80	26.00	55.00	9.40
Strawberries (mg)	33.30	62.00	67.10	3.90
Tangerines (mg)	65.00	75.00	Up 119.0	7.00
Watermelons (mg)	Up 14.30	66.00	38.00	Up 37.10
Net Change	28.90	16.40	16.40	1.90

In Summary

Your role

- Appreciator, patient observer, **let nature be first**
- Caretaker of soil
 - Create attractive environment for beneficial soil microbes
 - Underground economy
- Caretaker of trees
 - Watch for signs of distress or damage
 - The right tree care at the right times
- Give more than you take, help trees dance with microbes, **give honour to trees**



References

Links to books & studies

- Michael Phillips - Mycorrhizal Planet
- The Soils of the Regional Municipality of Ottawa-Carleton
 - https://sis.agr.gc.ca/cansis/publications/surveys/on/on58/on58-v1_report.pdf
- Translocation of C⁽¹⁴⁾-Labeled Compounds in Mycorrhizae and It Implications in Interplant Nutrient Cycling
 - <https://esajournals.onlinelibrary.wiley.com/doi/10.2307/1934844>
- An Alarming Decline in the Nutritional Quality of Foods: The Biggest Challenge for Future Generations' Health
 - <https://pmc.ncbi.nlm.nih.gov/articles/PMC10969708/>
- Why modern food lost its nutrients
 - <https://www.bbc.com/future/bespoke/follow-the-food/why-modern-food-lost-its-nutrients/>

