Designing Forest Gardens
- things to consider

Credit: Edible Forest Gardens

Credit: Edible Forest Gardens

FIGURE 2.6. A forest gap garden is another option in existing woods. Here, you cut a gap or clearing in the forest and replant with a range of plants, including species you hope will grow into the canopy such as northern pecan (hardy selections of *Carya illinoinensis*), persimmon (*Diospyros virginiana*), or mulberry (*Morus* spp.). The understory plantings can be sun-loving or partial-shade-tolerant species grown until the shade gets too deep or shade-tolerant edibles planted for the long haul.

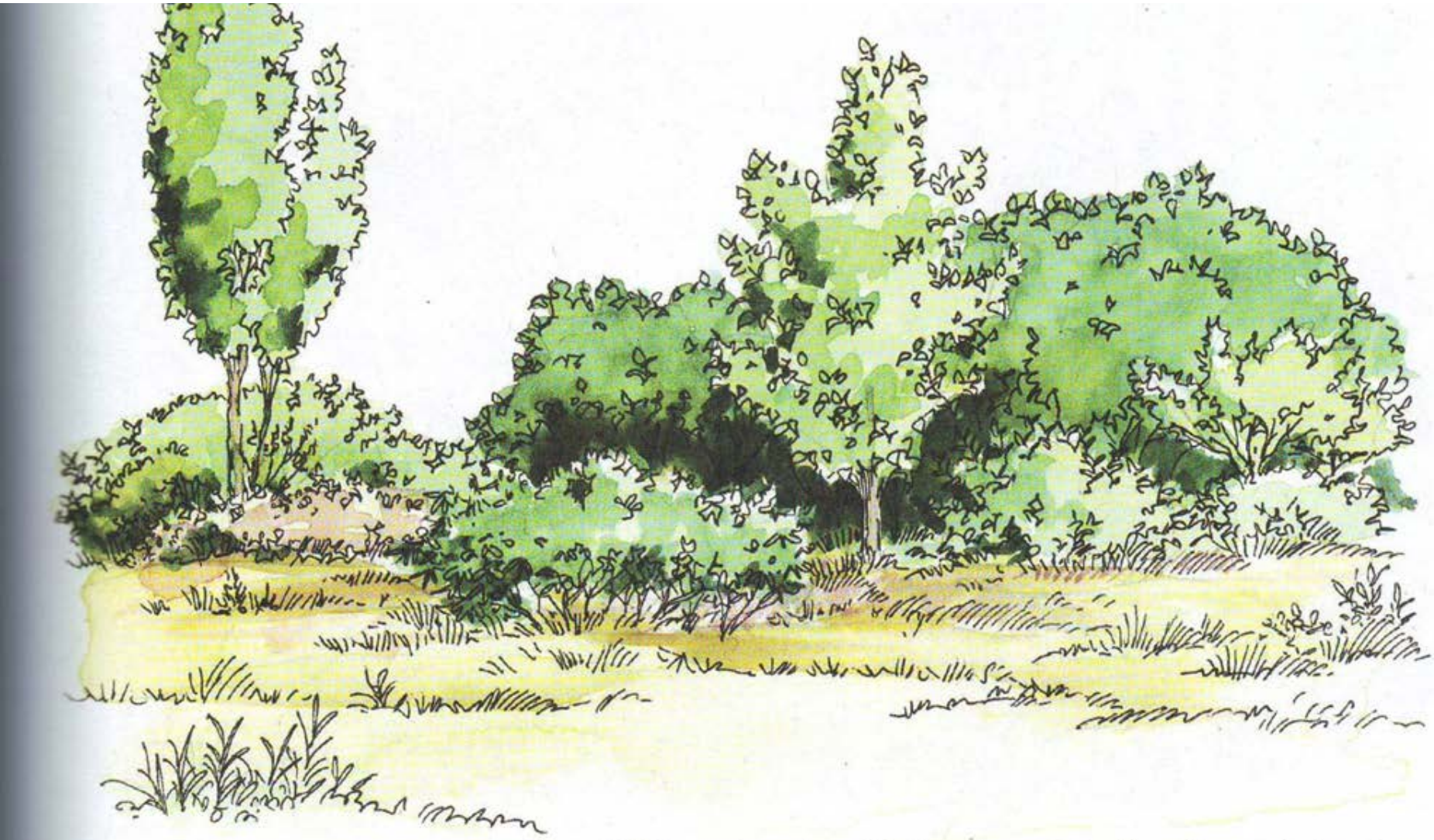


FIGURE 2.3. Midsuccession environments—from oldfield mosaics such as this through stages dominated by sun-loving pioneer trees—have higher net primary productivity than mature forests. Luckily, most of our developed woody crops, including apples, pears, peaches, apricots, cherries, persimmons, raspberries, hazelnuts, walnuts, and so on, are adapted to such habitats.

Credit: Edible Forest Gardens


BVA

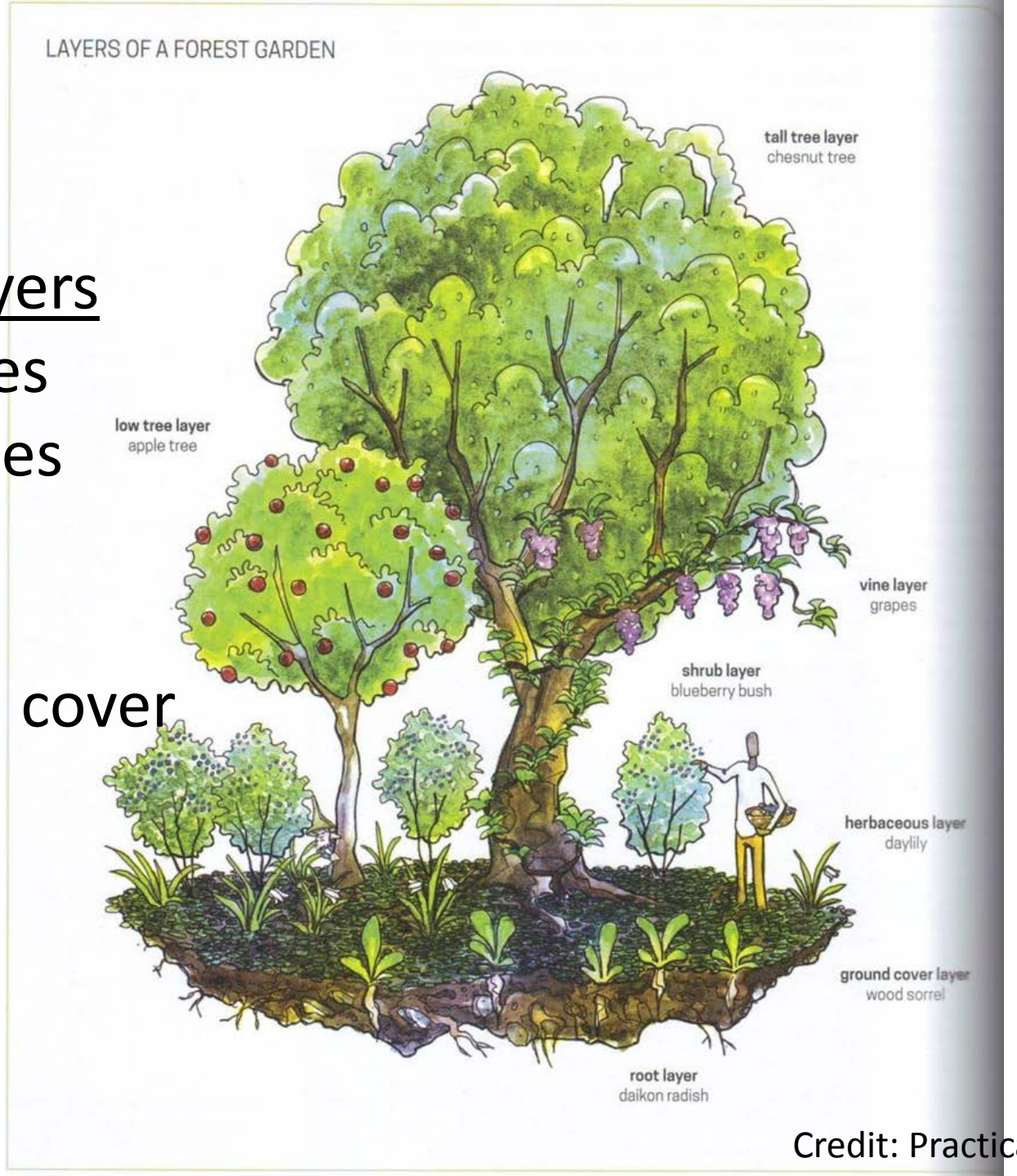
Ecological and Permaculture ‘Guilds’

- In Ecology, a group of plants that share a trait or function, such as nitrogen fixation, is called a guild.

- In permaculture, a group of mutually beneficial plants assembled into an interactive community is called a guild. These plant assemblages have complementary functions and niche differentiation.

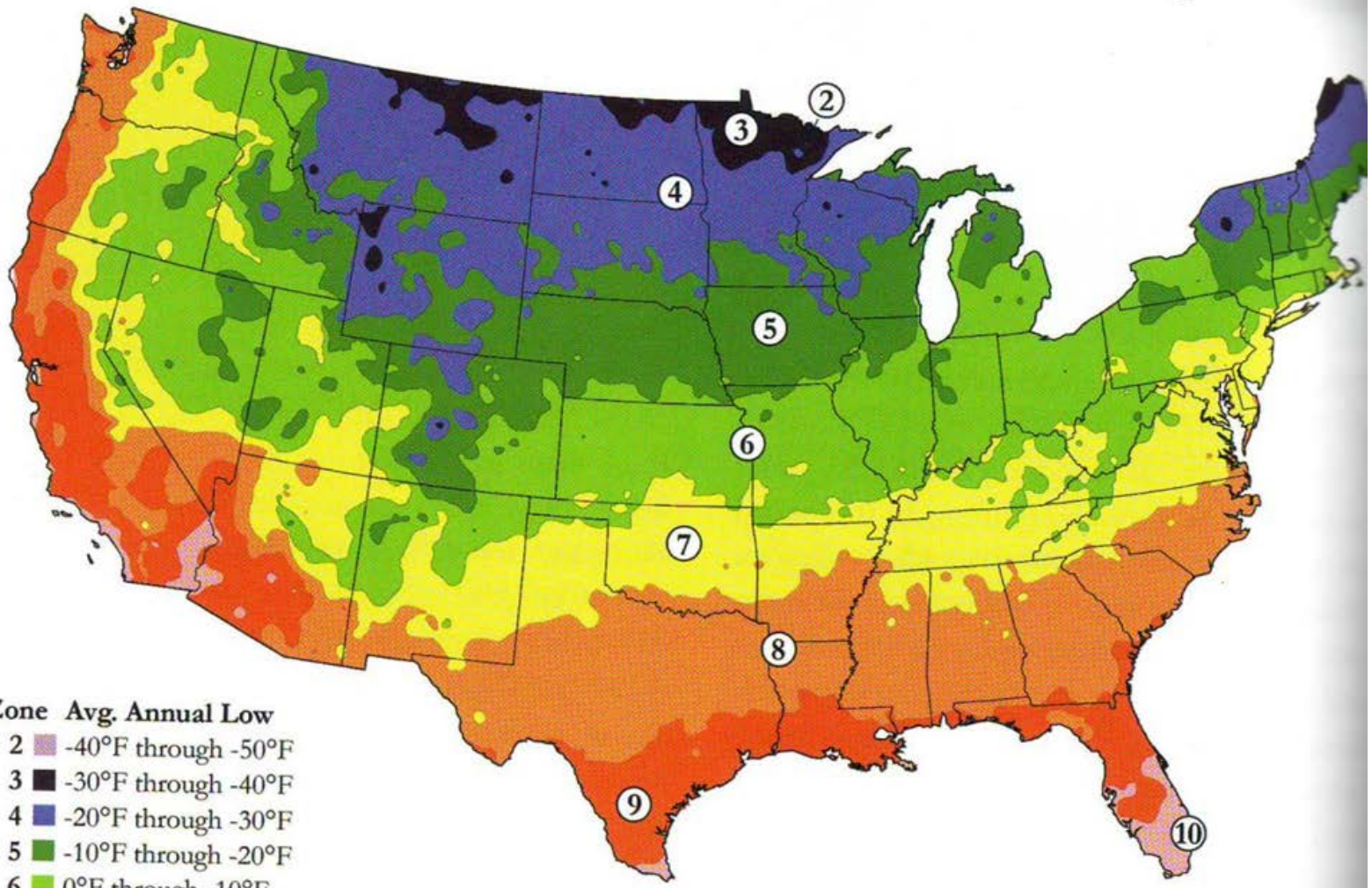
Plant Layers

- tall trees
- low trees
- shrubs
- herbs
- ground cover
- vines
- roots



Credit: Practical Permaculture

2006 arborday.org Hardiness Zones Map



Zone	Avg. Annual Low
2	-40°F through -50°F
3	-30°F through -40°F
4	-20°F through -30°F
5	-10°F through -20°F
6	0°F through -10°F
7	10°F through 0°F
8	20°F through 10°F
9	30°F through 20°F
10	40°F through 30°F

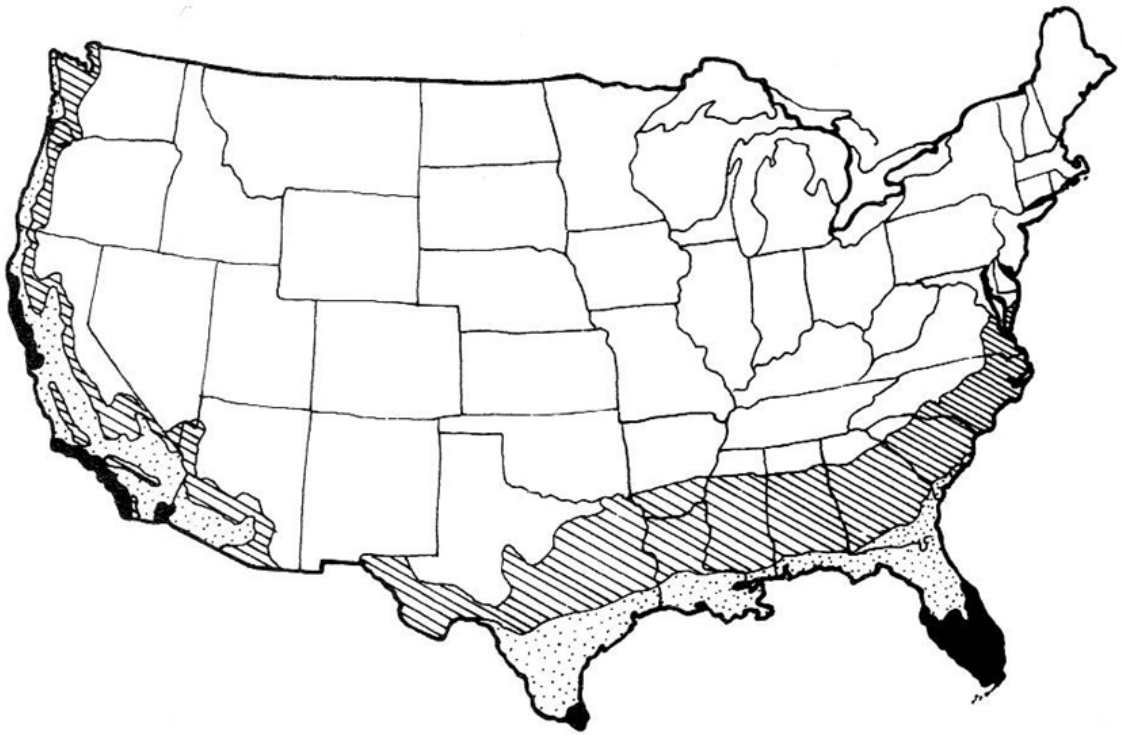
Go to arborday.org to find the zone for your zip code.

You can also find trees for planting in your zip code.

© 2006 by The National Arbor Day Foundation®

Hardiness zone maps provide a generalized idea as to varietal hardiness, but they cannot begin to account for microclimate potential.

Chilling requirements for fruit trees to set fruit buds

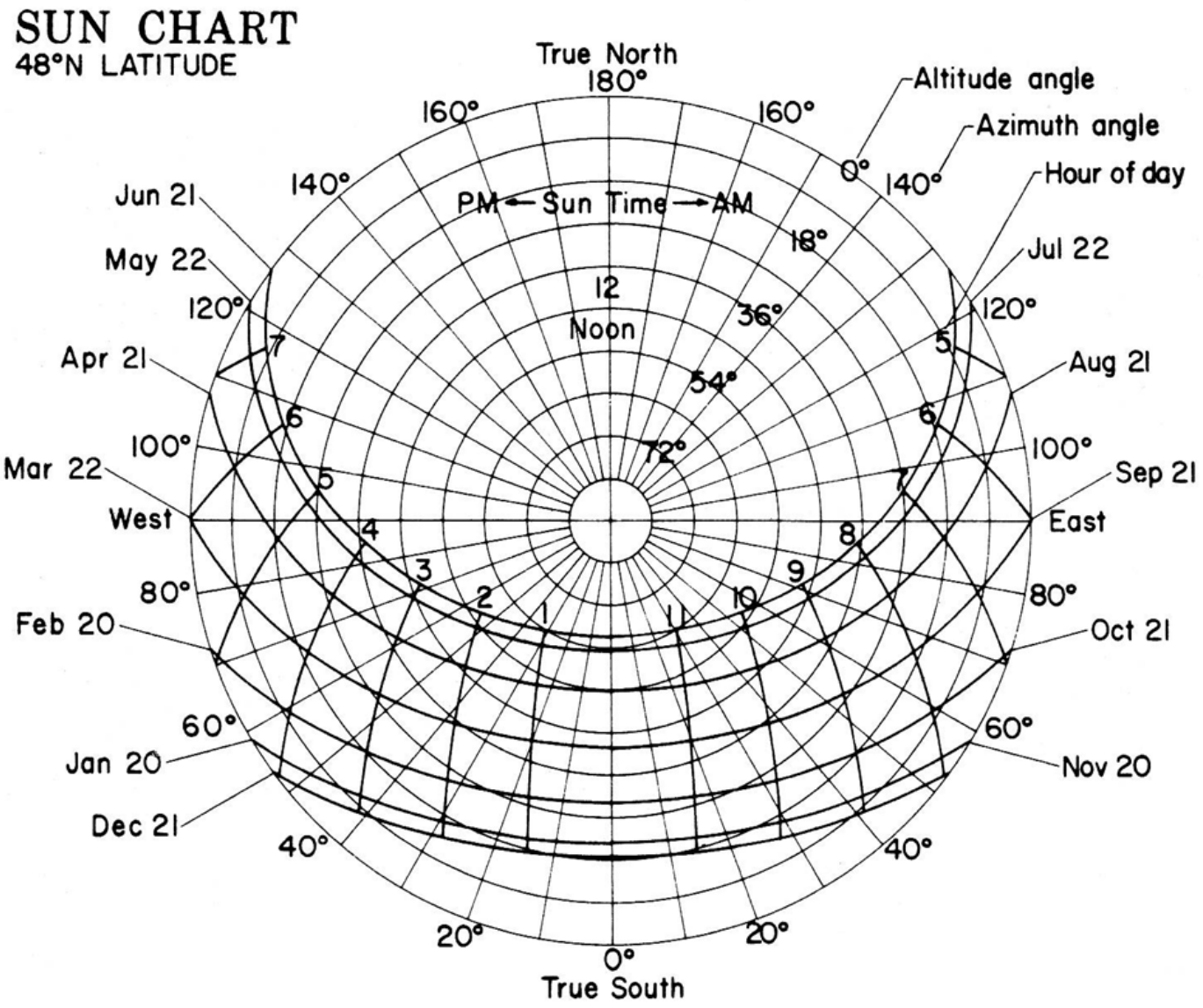


Zone	Hours of Accumulated Chill (normal winter)
8	600–1,200
9	400–600
10	0–400

Figure 10.1 The three main zones of low-chill winters.

Credit: The Holistic Orchard

Day length (short day, long day, day neutral) and sun/shade tolerance



Credit: The Holistic Orchard

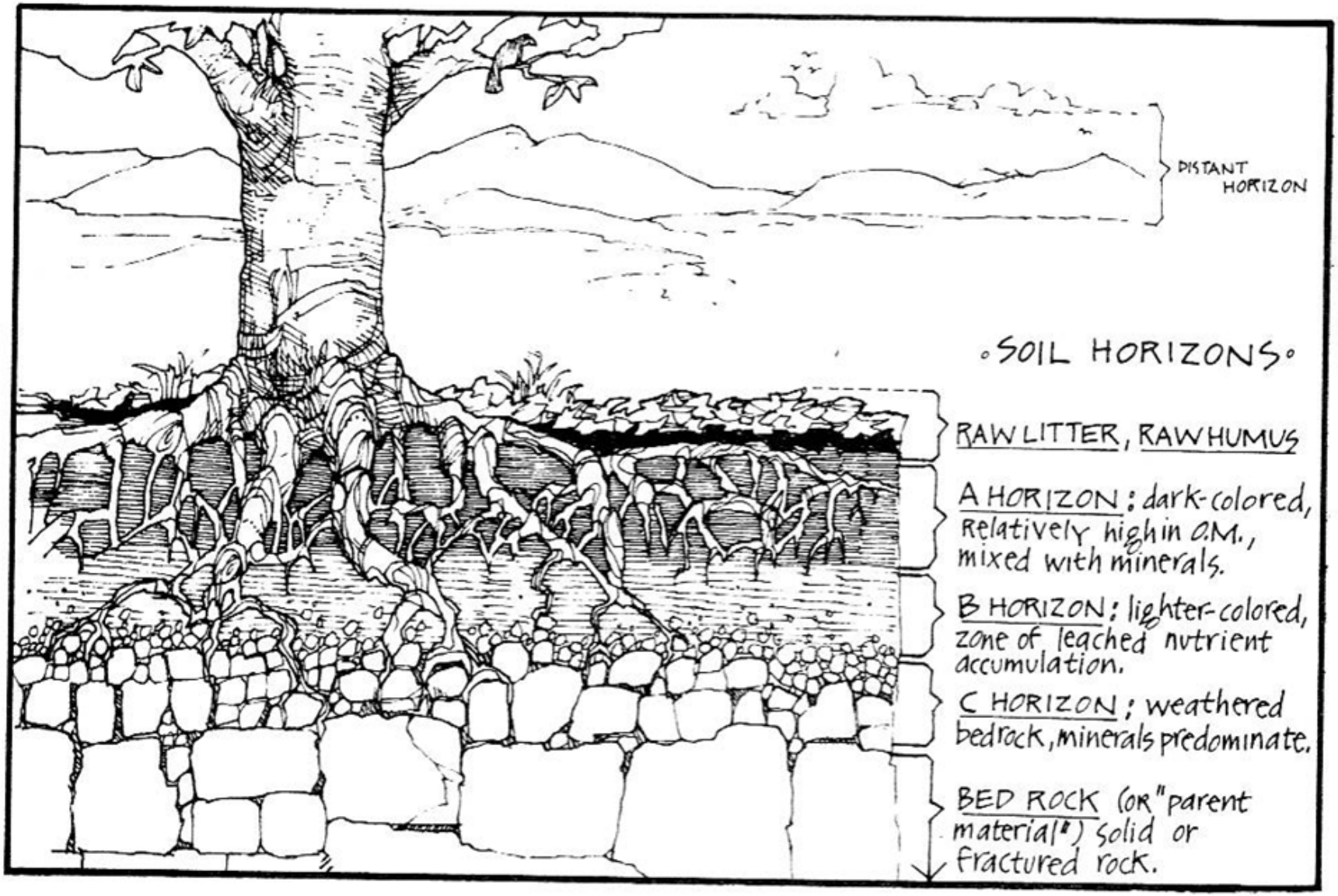


Figure 3.9 As edible landscapers, we are most concerned with the quality of soil in horizon "A."

Credit: Roots Demystified

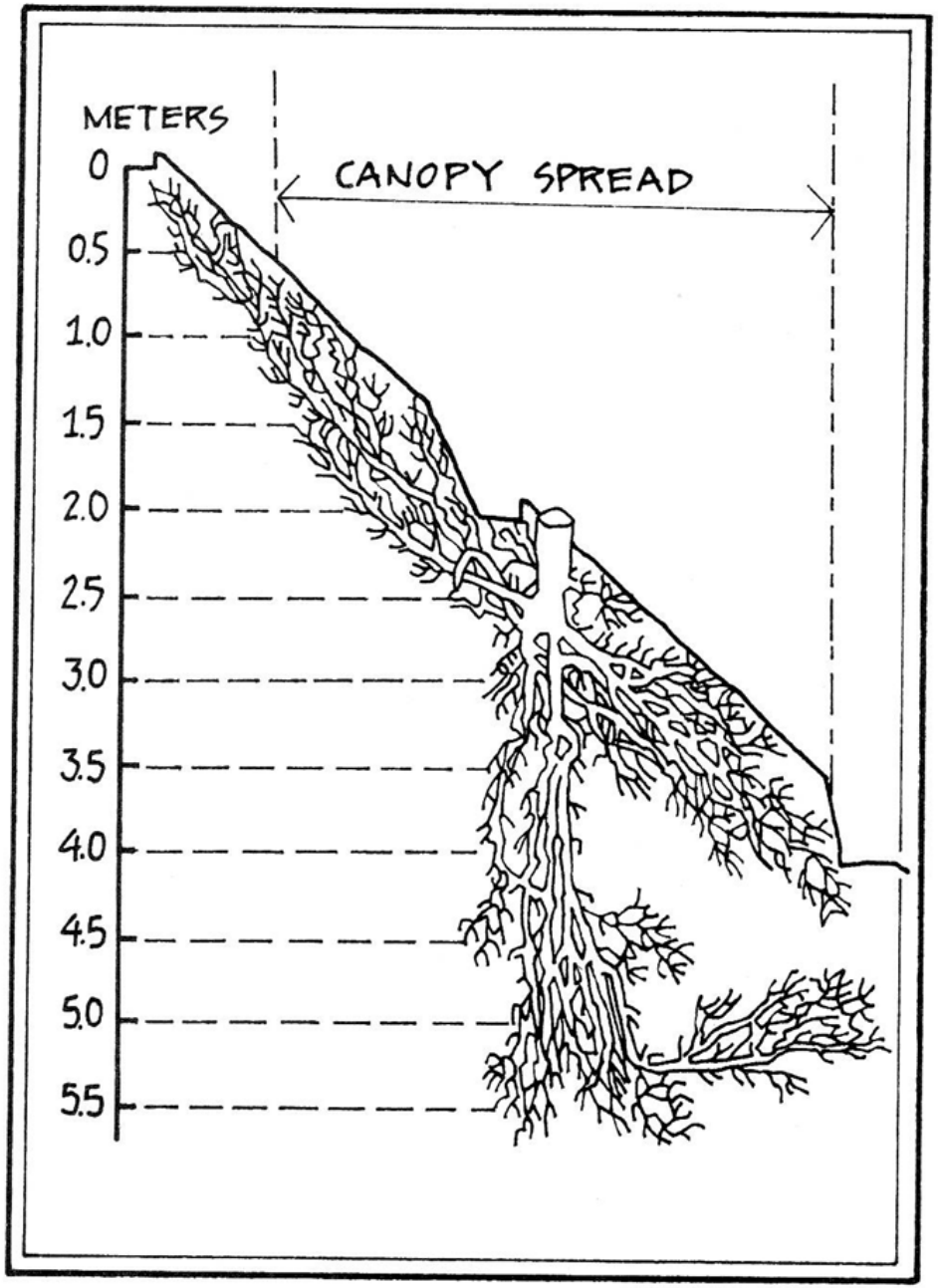


Figure 11.6 A 16-year-old apricot tree growing on a terraced slope. From a Russian study.

Credit: Designing and Maintaining your Edible Landscape Naturally

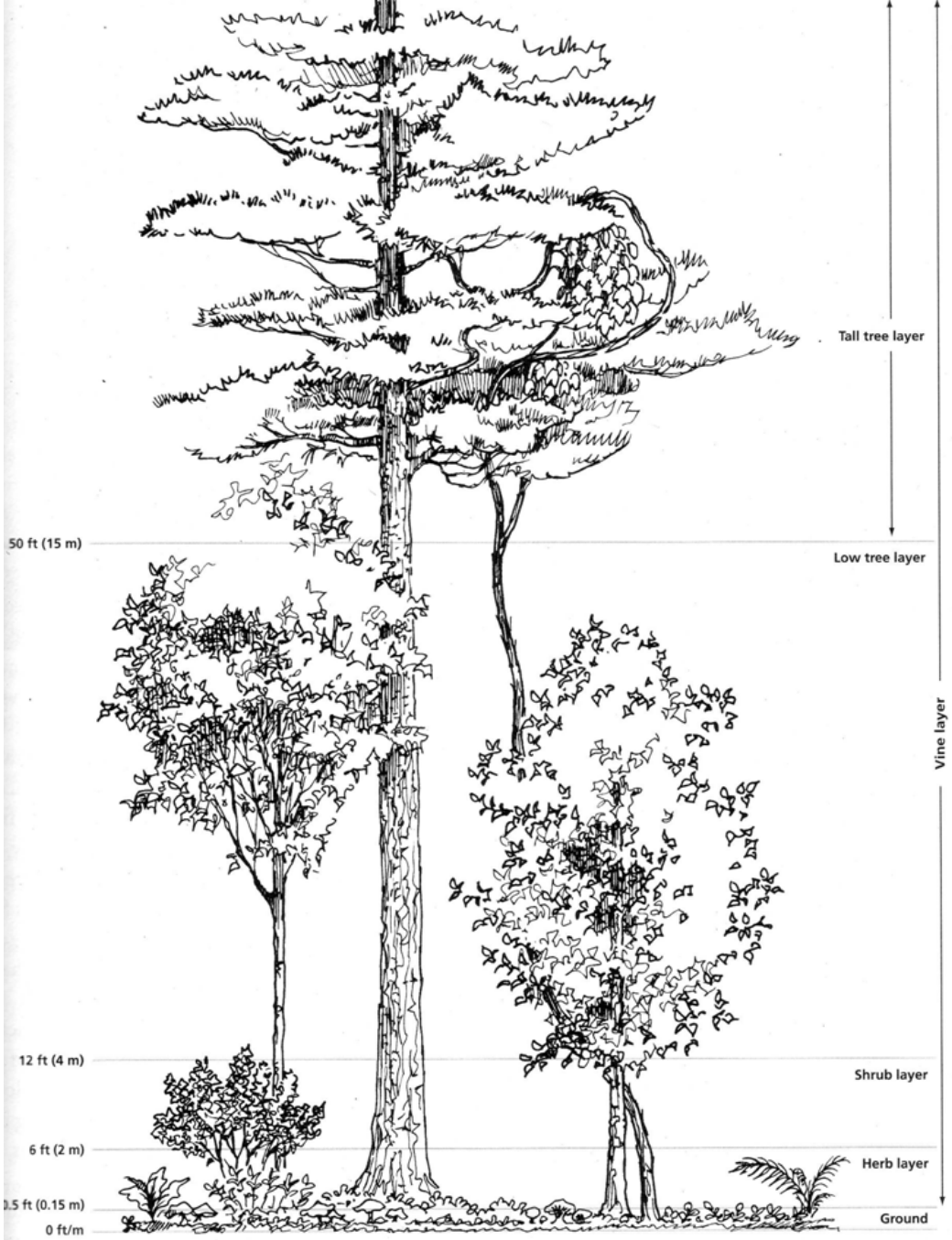
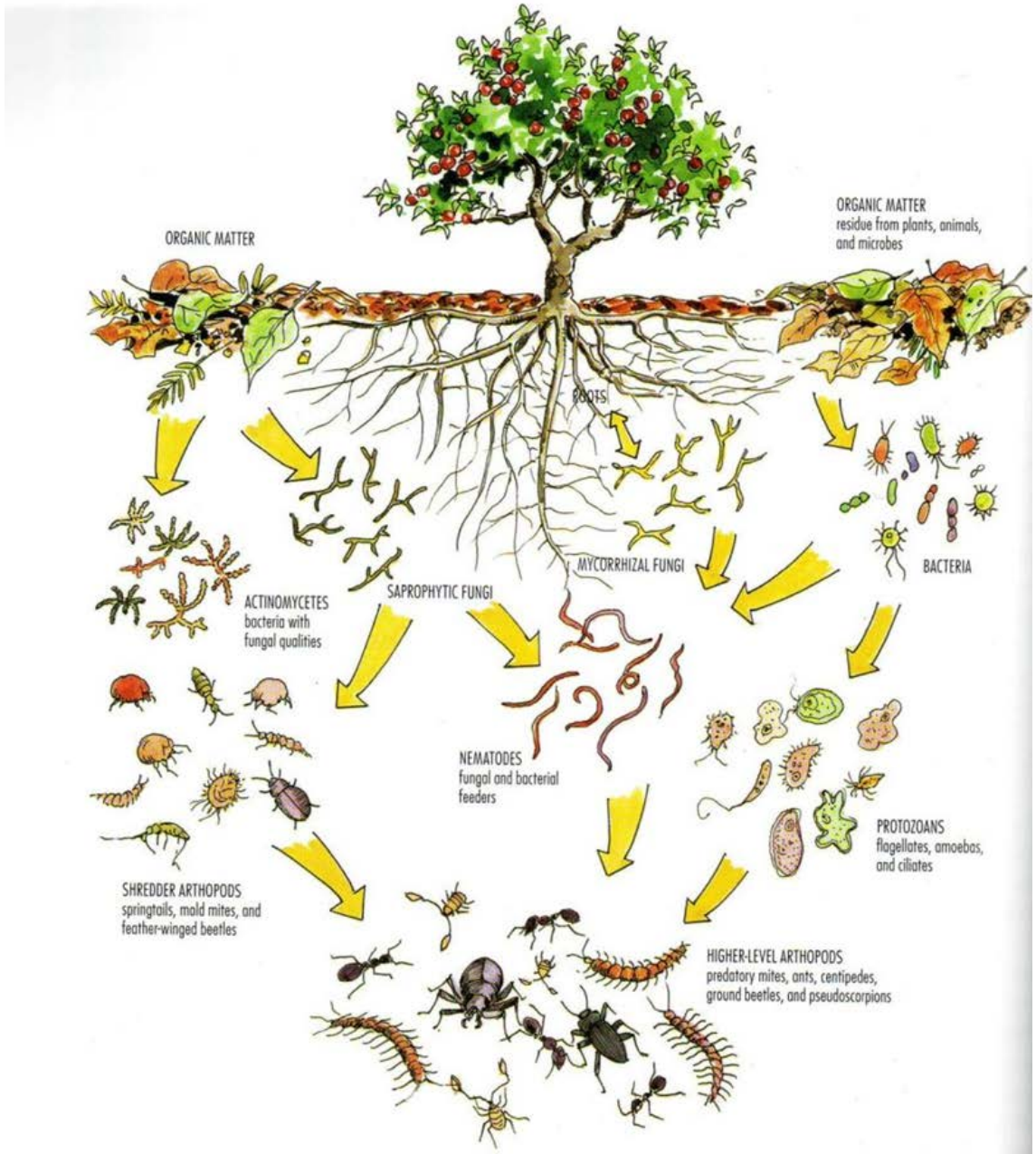


FIGURE 3.2. Forest garden vegetation layers, absolute definitions.

Credit: Edible Forest Gardens



Interdependent and interconnected networks of organisms interact to make life possible. The soil food web encompasses the microbes and arthropods that ultimately provide balanced mineral nutrition for fruiting plants and thus promote overall tree health. Go, biology, go!

Credit: The Holistic Orchard

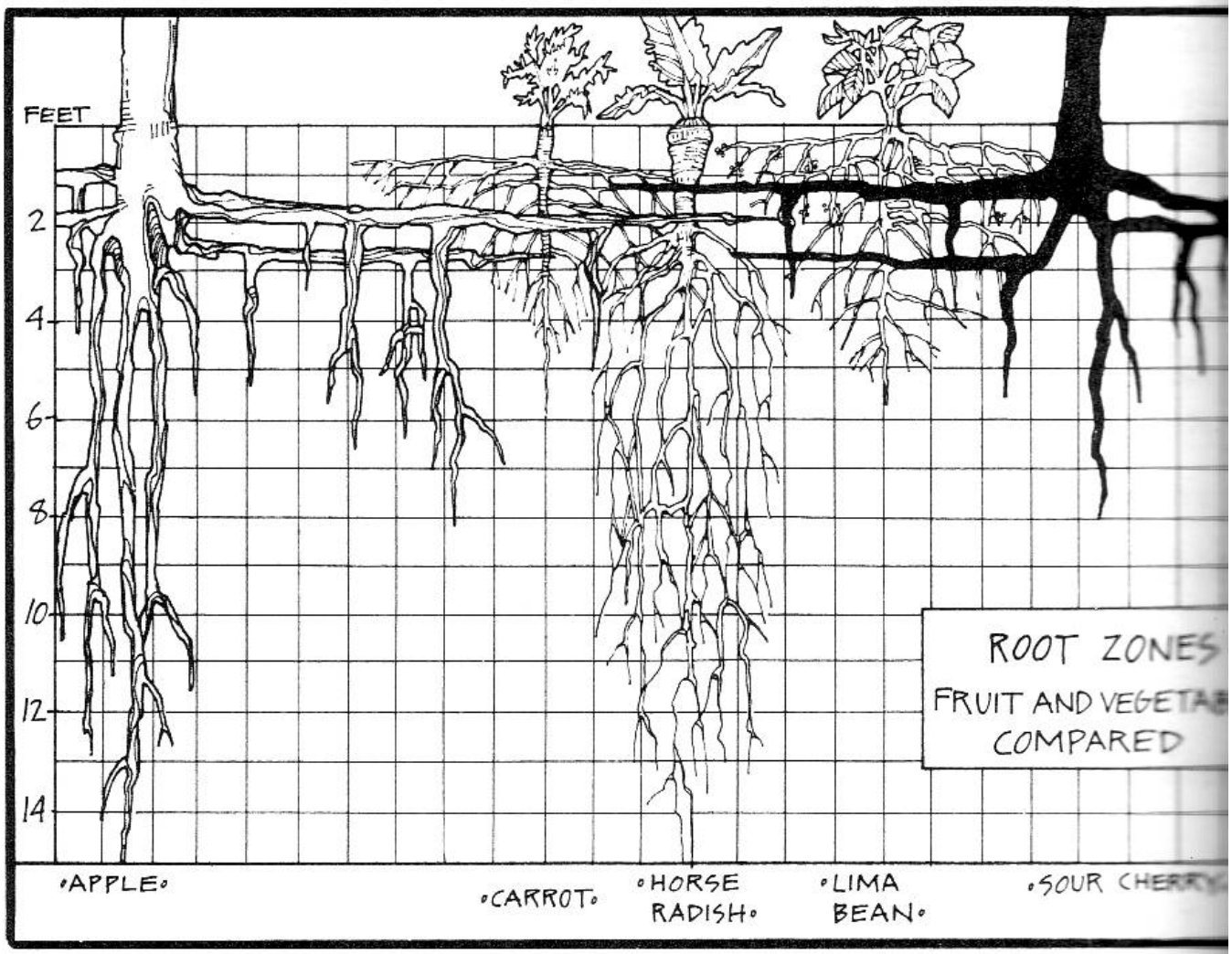
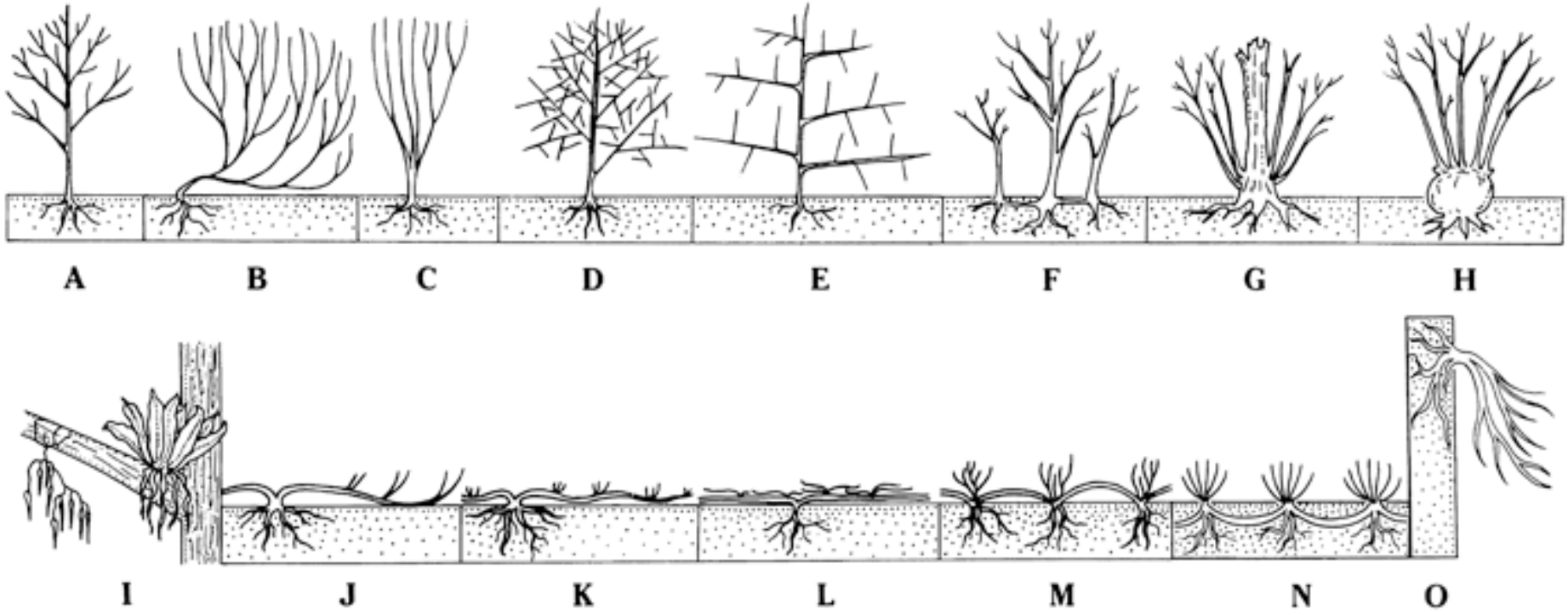


Figure 11.3 A fruit tree's roots may be shallower t those of nearby vegetables. The findings of five differ studies were combined here. Each study was done in id soil.

Credit: Designing and Maintaining your Edible Landscape Naturally

Plant ‘habit’
the general appearance of a plant, including size, shape and growth form



m

plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&glossary=yes&term=habit&ill=Fig.+1+

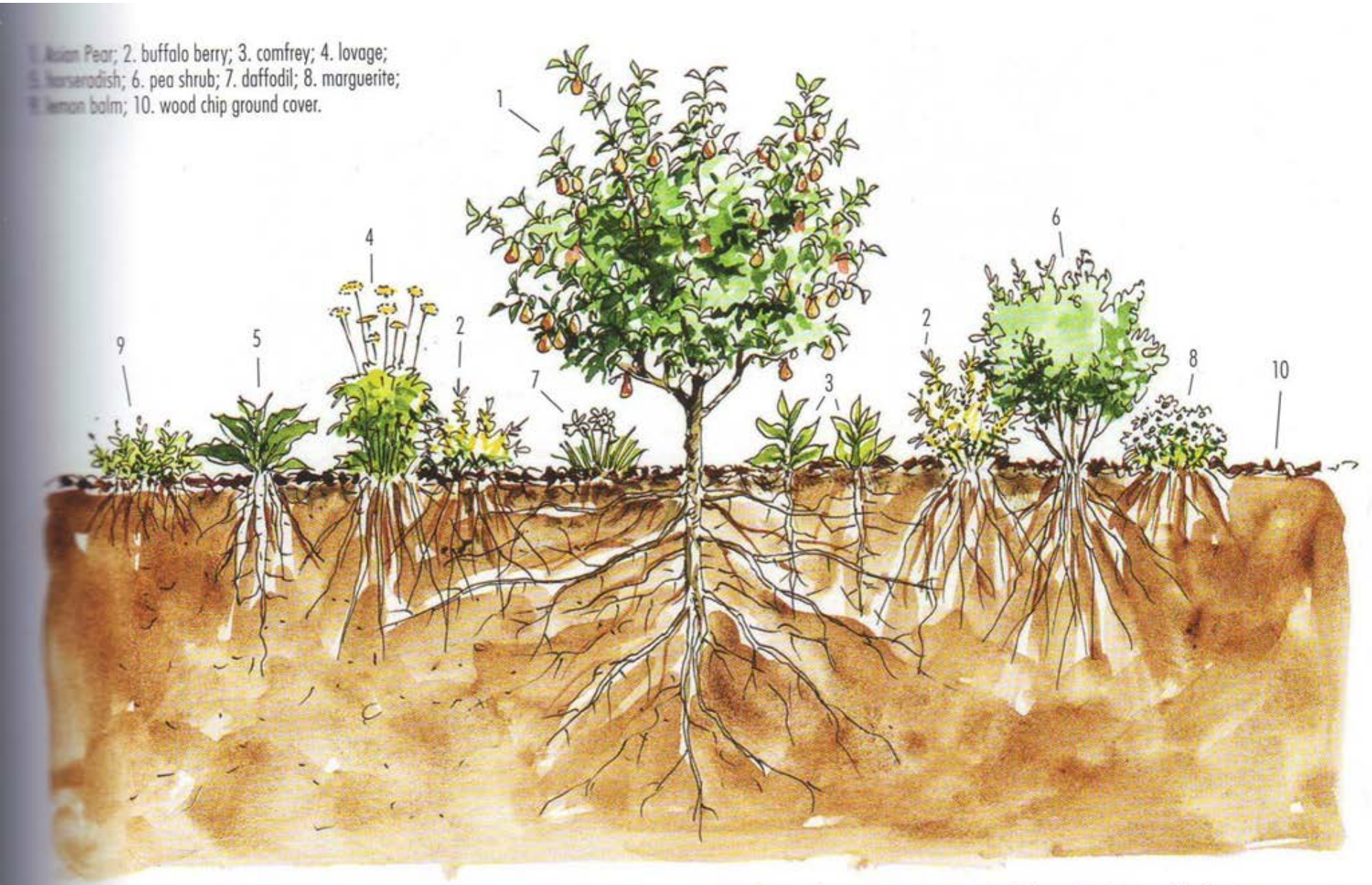
Plant Habit/Growth Forms

TREE	SHRUB/BUSH	VINE	FORB	GRASS	AQUATIC PLANT
large, woody plant having secondary branches supported on a main stem or trunk	smaller, woody plant with multiple stems	herbaceous or woody plant with a climbing or twining stem	herbaceous, broad-leaved plant often with showy flowers	herbaceous plant with slender leaves (blades), and inconspicuous flowers	herbaceous plant (generally) that grows partly or wholly in the water

WOODY PLANTS

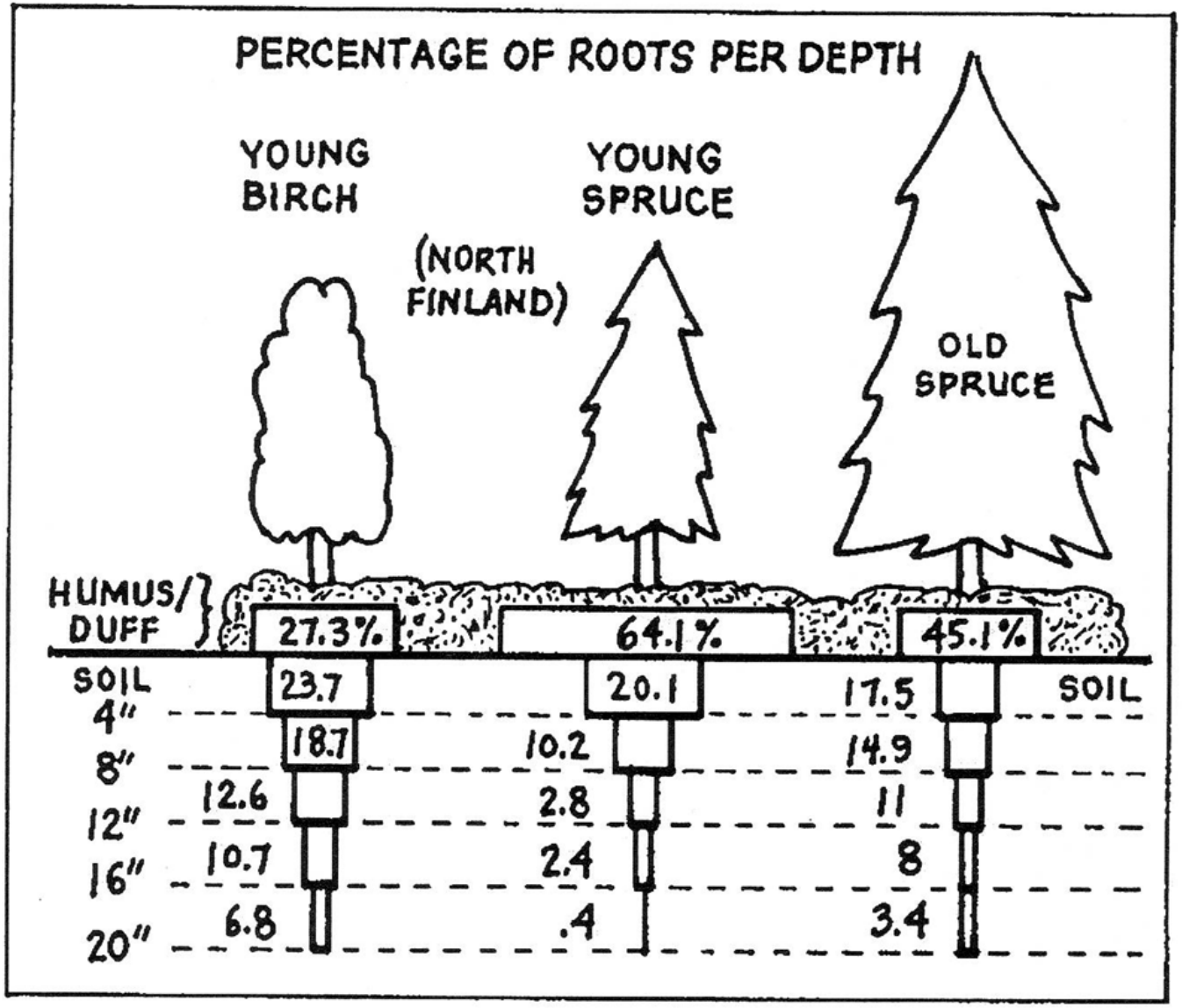
HERBACEOUS (non-woody) PLANTS

Diagram created by weedcenter.org



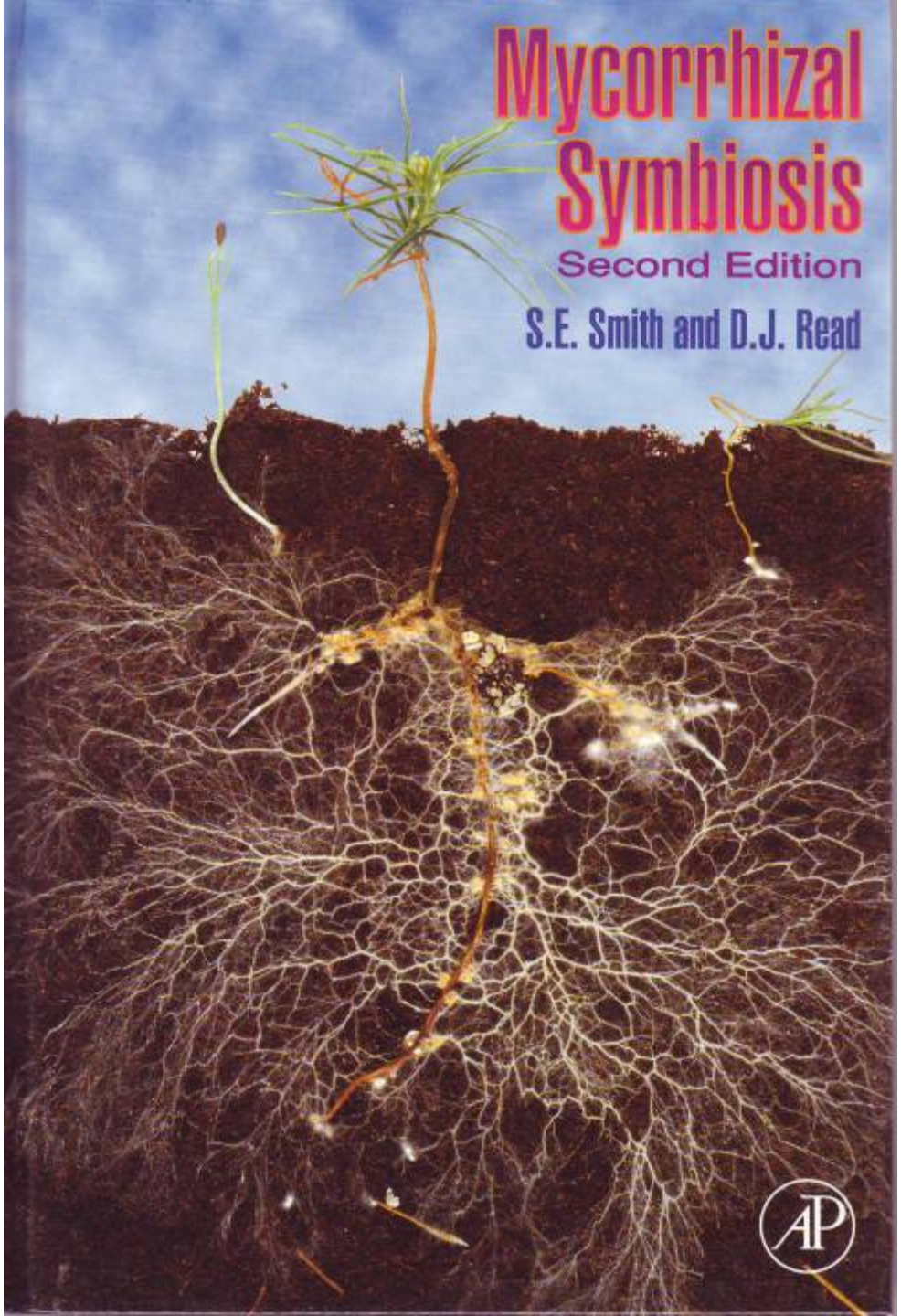
This polyculture of fruit trees, berry plants, and taprooted herbs shows how light space above and root space below can be fully utilized in a guild planting.

Credit: The Holistic Orchard

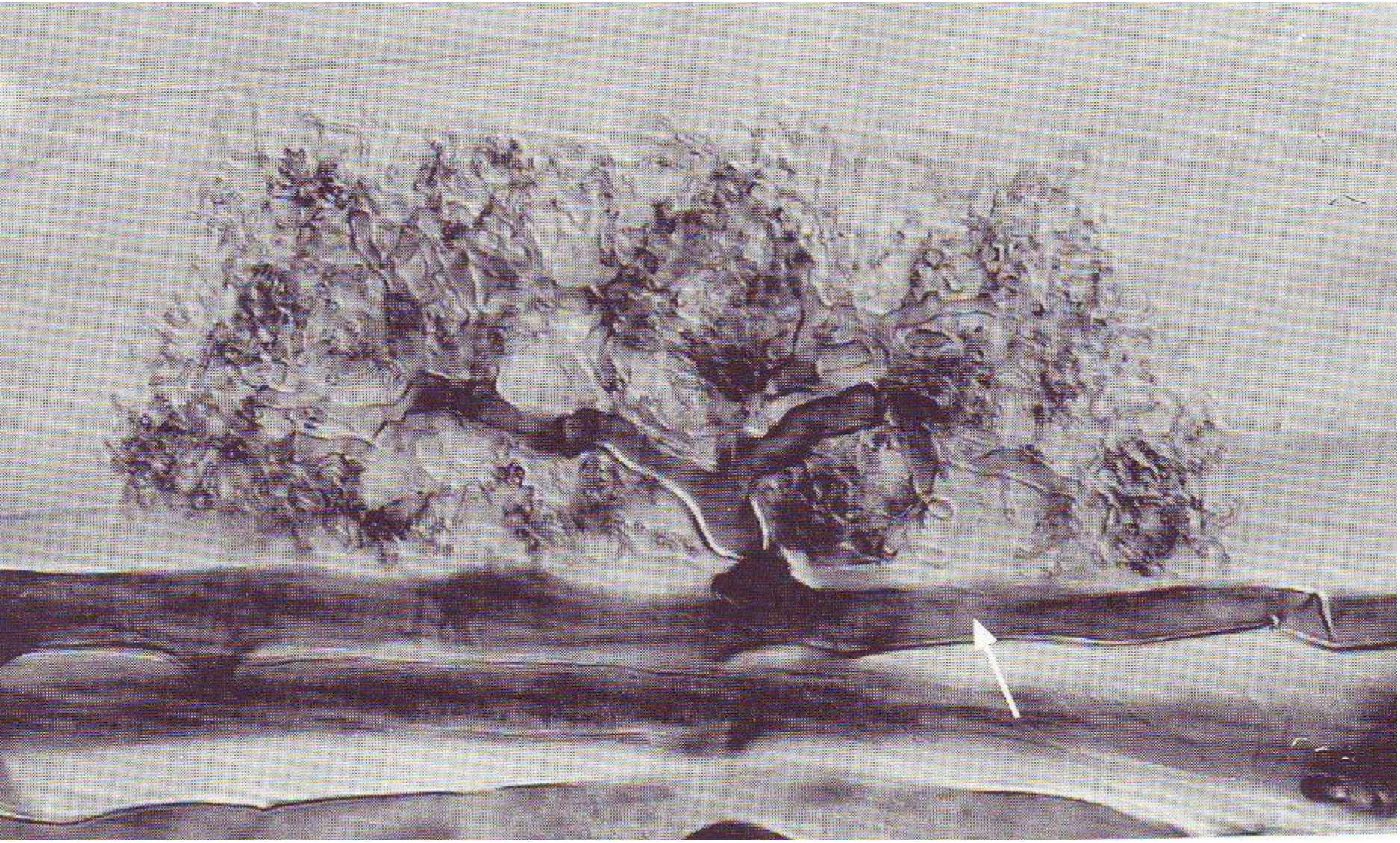


Credit: Roots Demystified

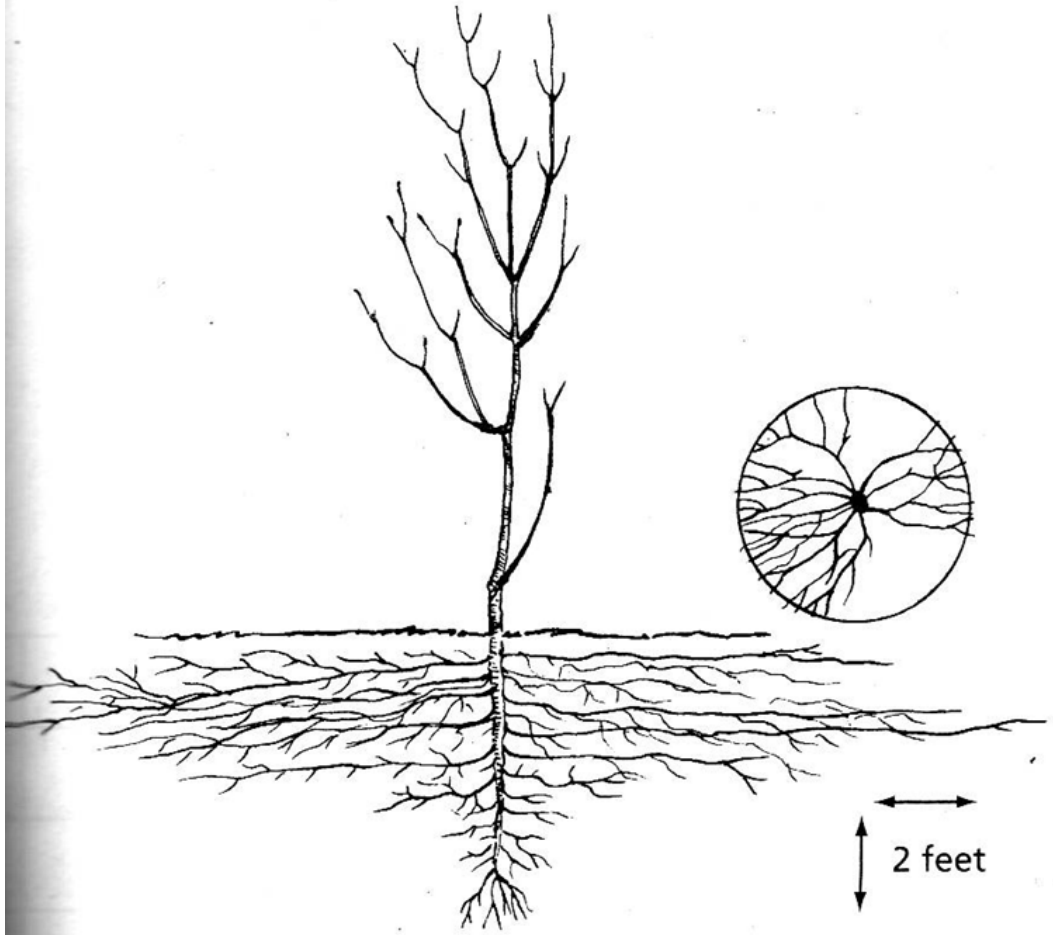
Figure #57: This amazing illustration shows how roots can grow up to feed in the duff in order to absorb nutrients that are as "fresh"as possible.


Mycorrhizal
Symbiosis
Second Edition
S.E. Smith and D.J. Read
AP

Mycorrhizae arbuscule inside a plant cell



(Smith and Reed, 1997)



GURE 3.12. This pecan tree in Georgia was six years old when g up for this diagram. It had a branch spread of 5.5 feet (1.6 m) d was 13 feet (4 m) high, but its roots were 6 feet (2 m) deep d 24 feet (7 m) wide. The circle shows the orientation of the ven largest lateral roots. *Adapted from Woodruff, 1934.*

Credit: Edible Forest Gardens

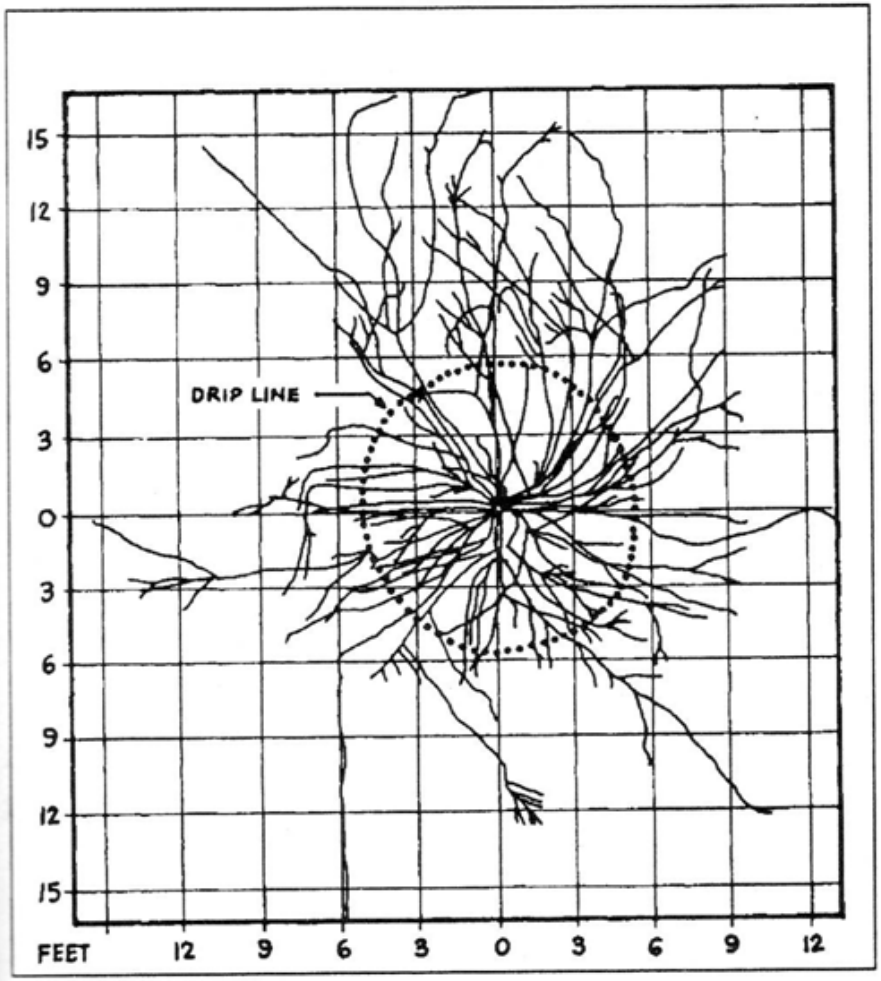


Figure #40: The full root system of a ten-year-old apple tree. (The scale is in one-foot squares.)

Credit: Roots Demystified

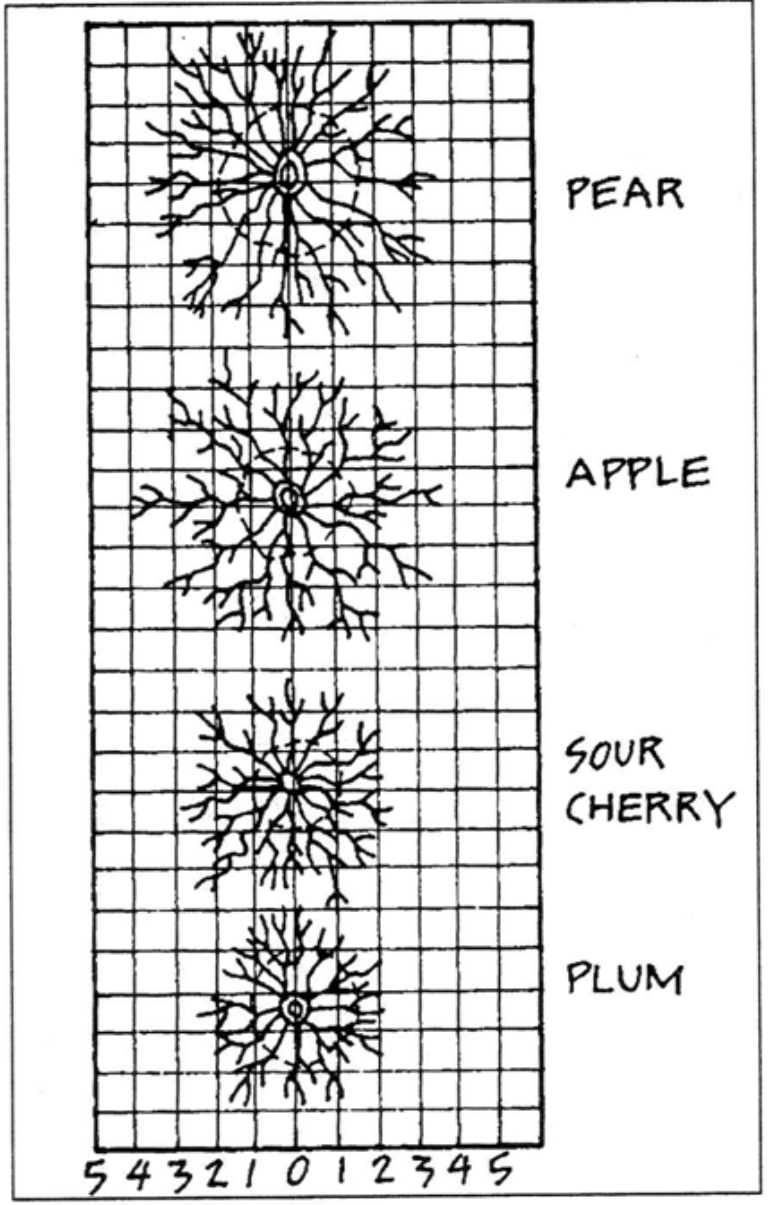
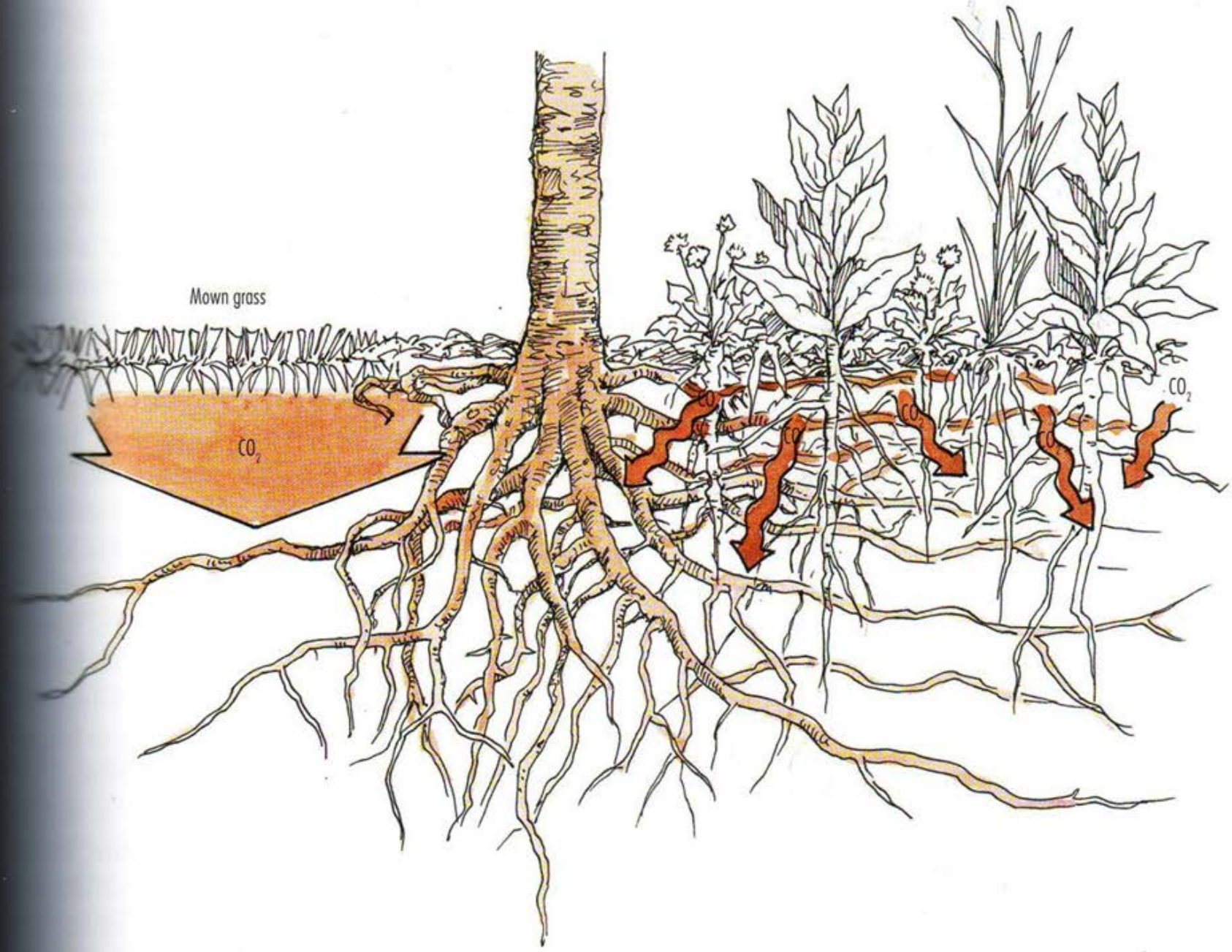


Figure #41: All trees are not created equal. This illustration, in one-meter squares, shows how different root systems spread.

Paul Vossen, the University of California Cooperative Extension tree-crops farm advisor for Sonoma County, simultaneously tested many possible kinds of irrigation systems for fruit trees



...ity of a regularly mown lawn can be as much as twenty times greater than that of a taprooted understory. Root respiration of either results in a corresponding ...dioxide density that has relevance for tree feeder roots seeking friendly ground in the humus.

Credit: The Holistic Orchard

The broad reach of comfrey around this apple tree keeps grass at bay throughout the summer months.

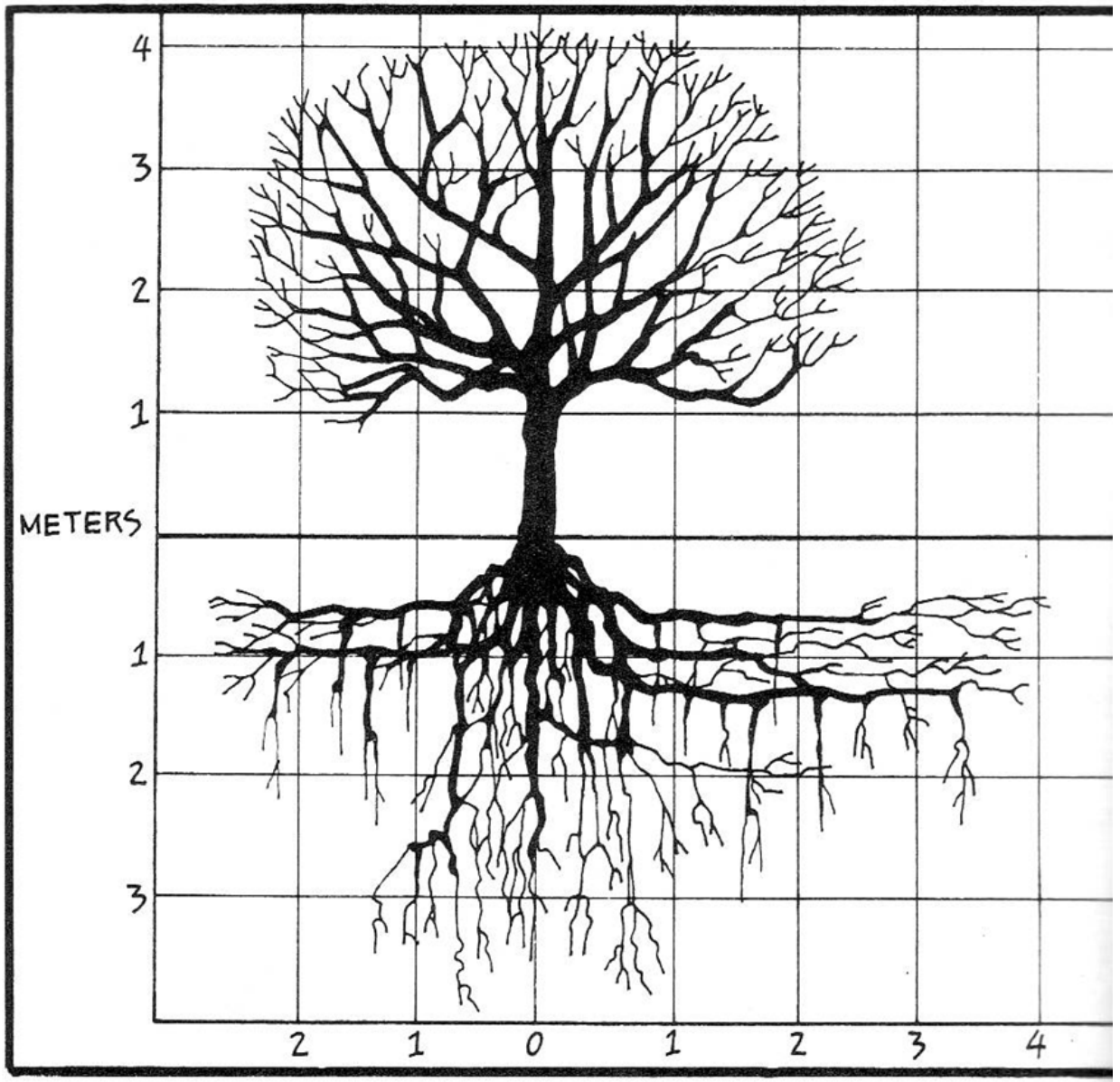


Figure 11.2 A 20-year-old standard-size apple tree (Antonovka roots) studied in Russia.

Credit: Designing and Maintaining your Edible Landscape Naturally

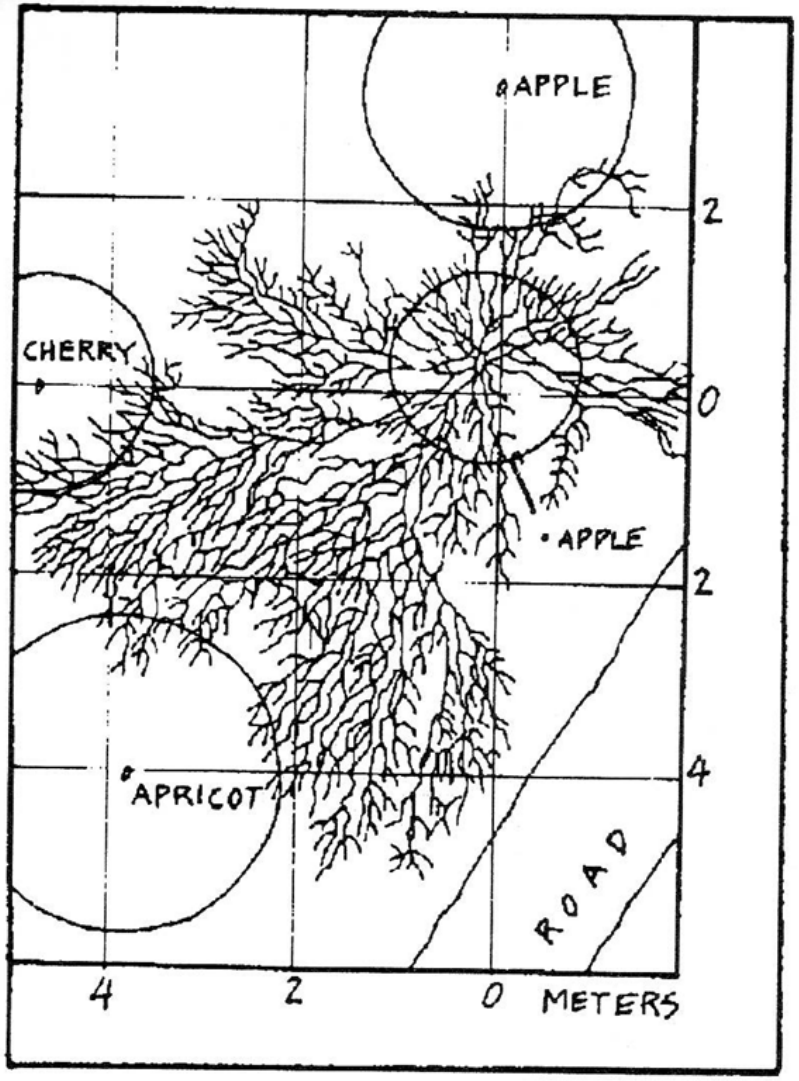


Figure #38: This apple tree's roots extend far beyond the circle representing the canopy of the tree and avoid the compacted soil of the roadway. (Scale is in meters.)

Credit: Roots Demystified

Root spread in clay textured soil verses sandy textured soil

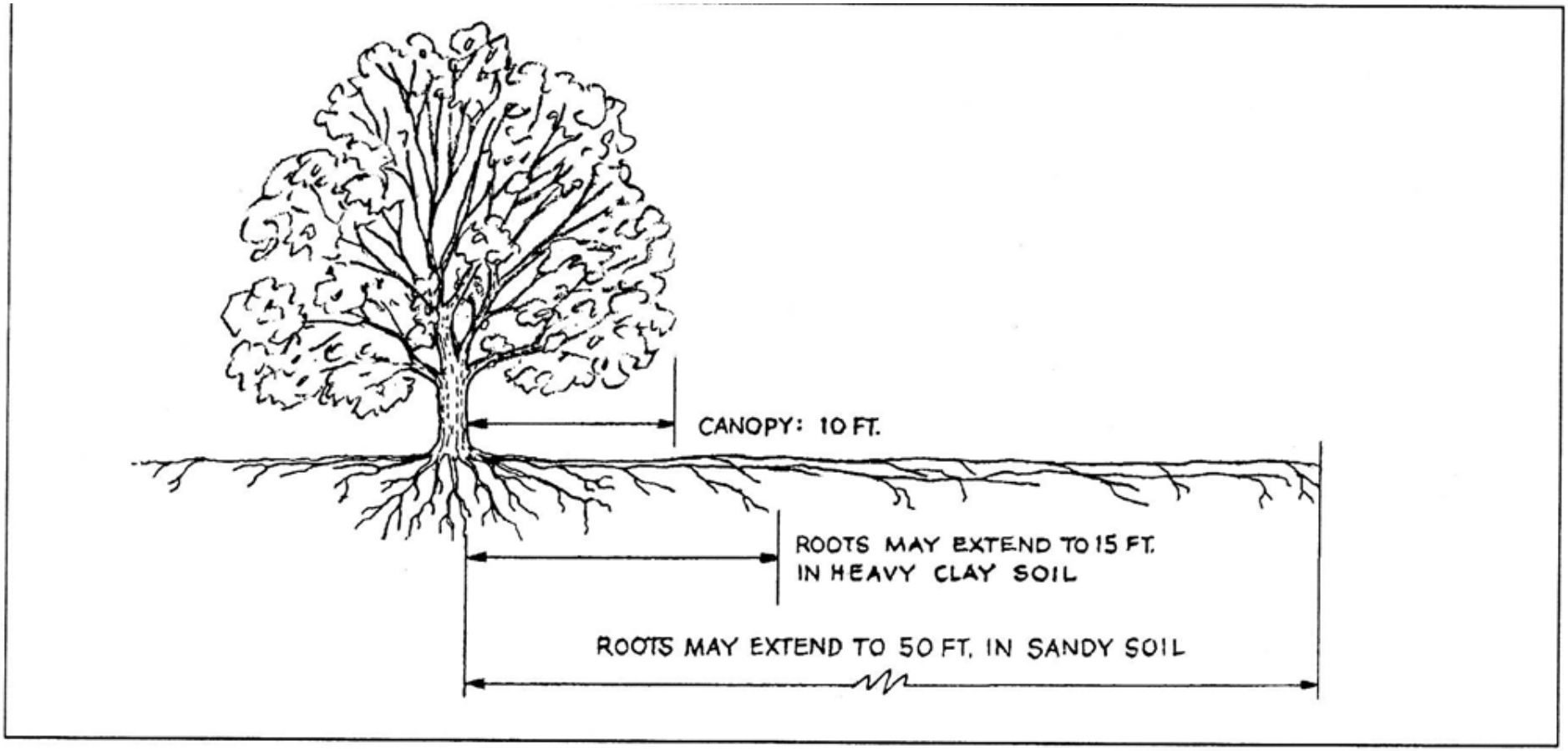


Figure #47: Trees' roots commonly grow one-half wider than the dripline (canopy), and occasionally to as much as three to five times further.

Credit: Roots Demystified

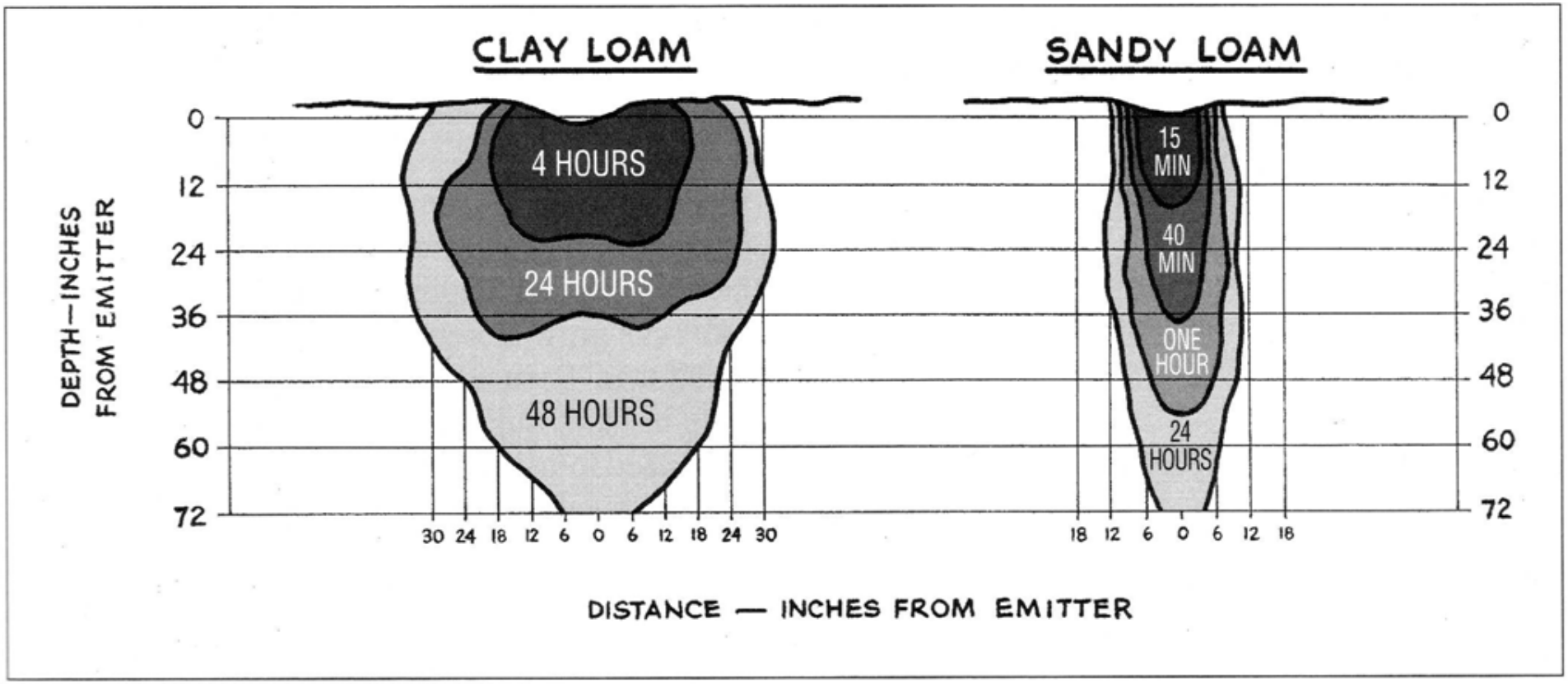
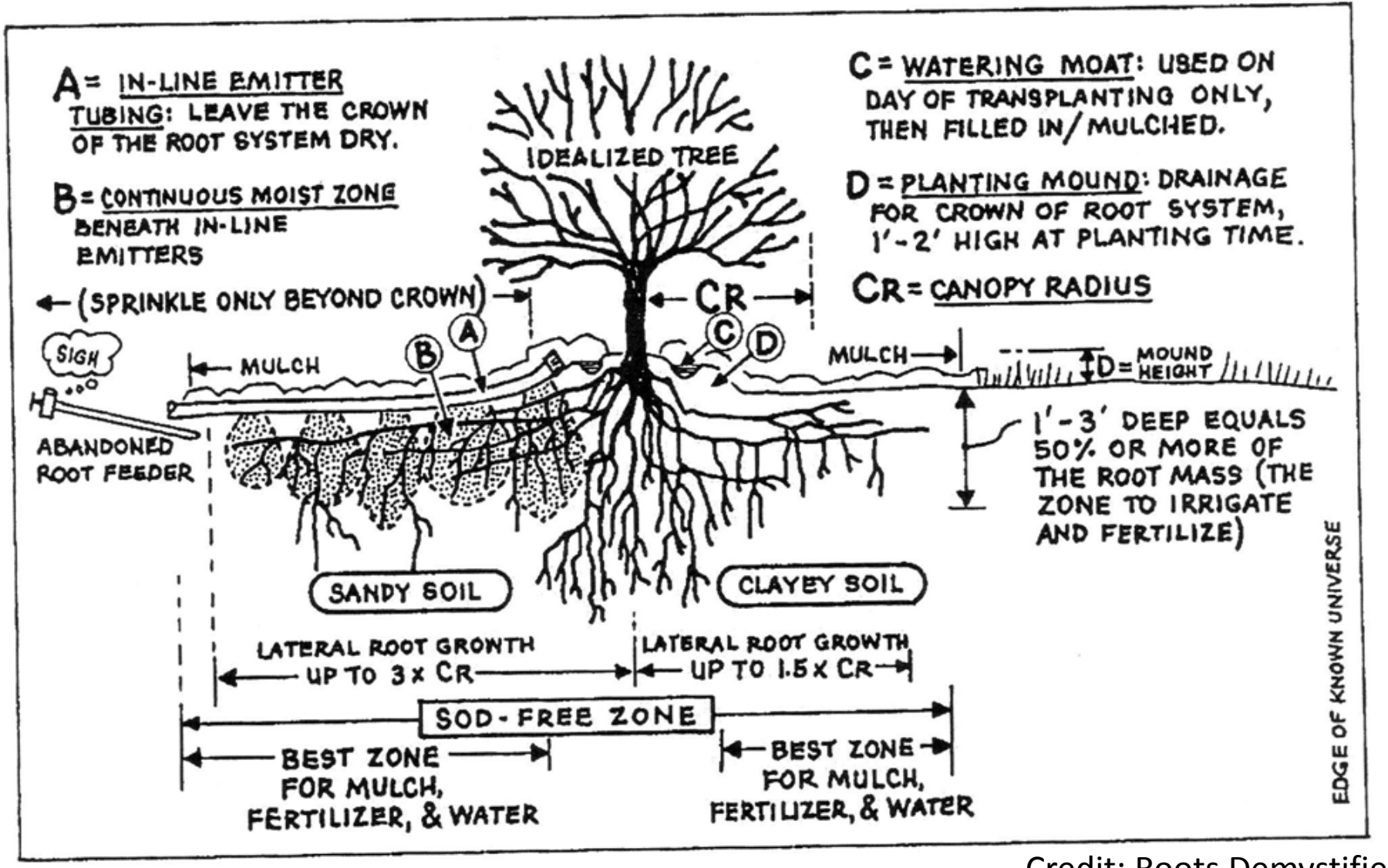


Figure #7: This drawing shows how widely water spreads in different soils over time. This pattern is much like that produced by a drip irrigation emitter on similar soil.

Credit: Roots Demystified



Credit: Roots Demystified

Figure #65: This is a detailed illustration of how one might plant a shrub or tree on a mound. It also illustrates how to irrigate on the day of planting by using a moat of water. Shortly thereafter, the moat is filled in and drip irrigation at the dripline begins, to be followed by wider and wider lines or loops of in-line emitter tubing.

(From: *Drip Irrigation, For Every Landscape and All Climates.*)

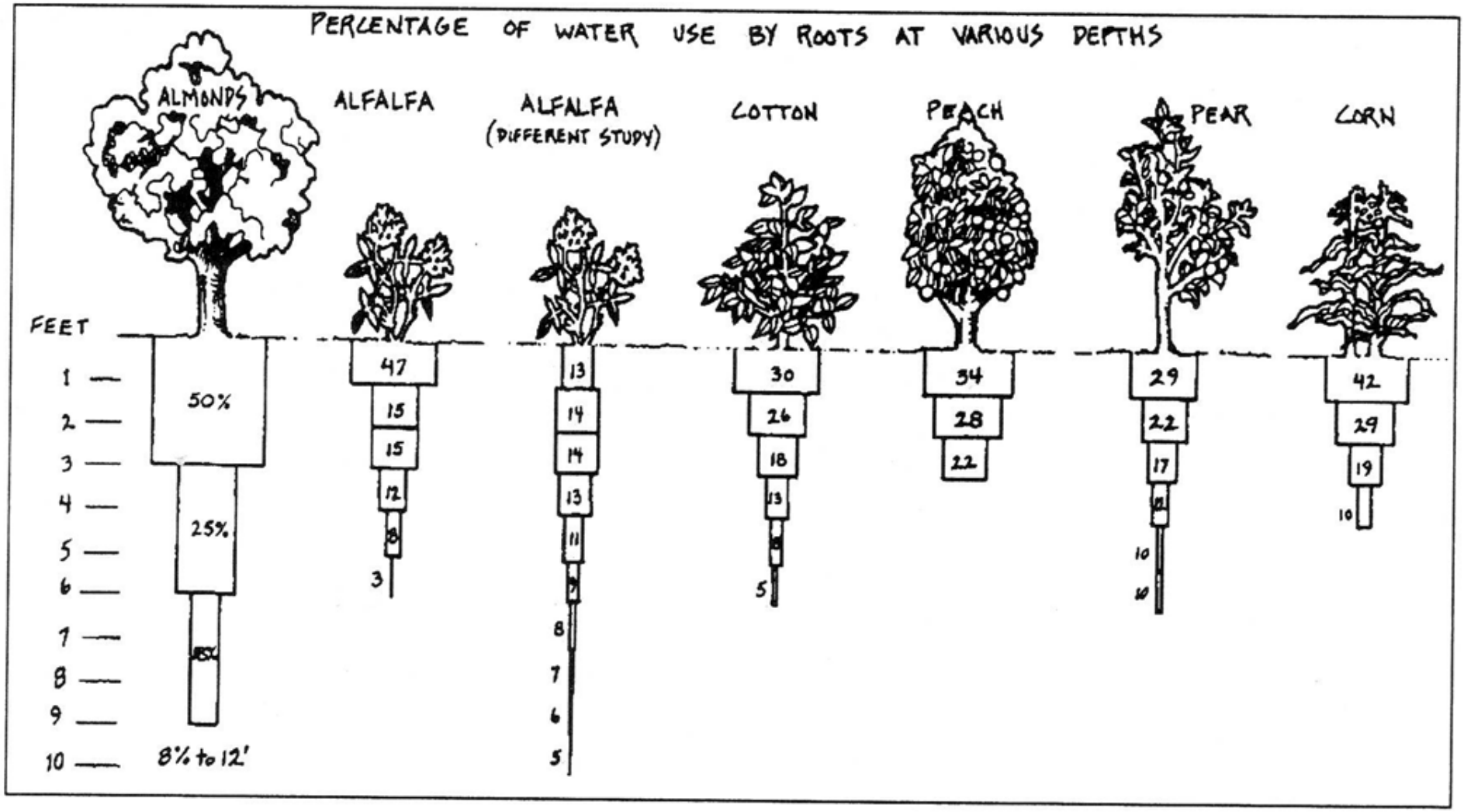
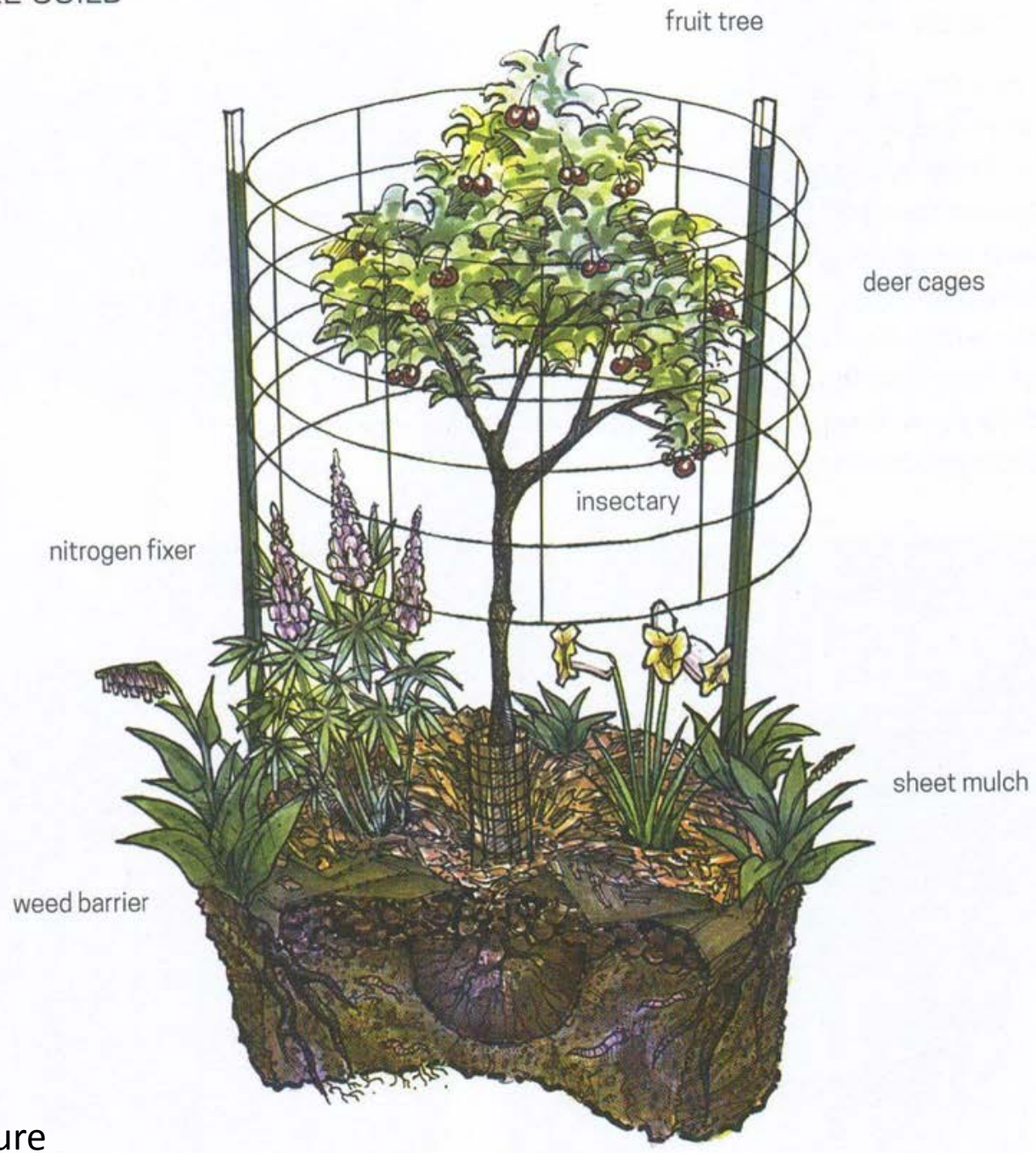


Figure #54: The height of a plant does not represent the depth of the root system. (The relative width of the root system isn't shown in this illustration.) Again, the top one to two feet of the soil is where most of the moisture is absorbed.

Credit: Roots Demystified

TEMPERATE FRUIT TREE GUILD



Credit: Practical Permaculture

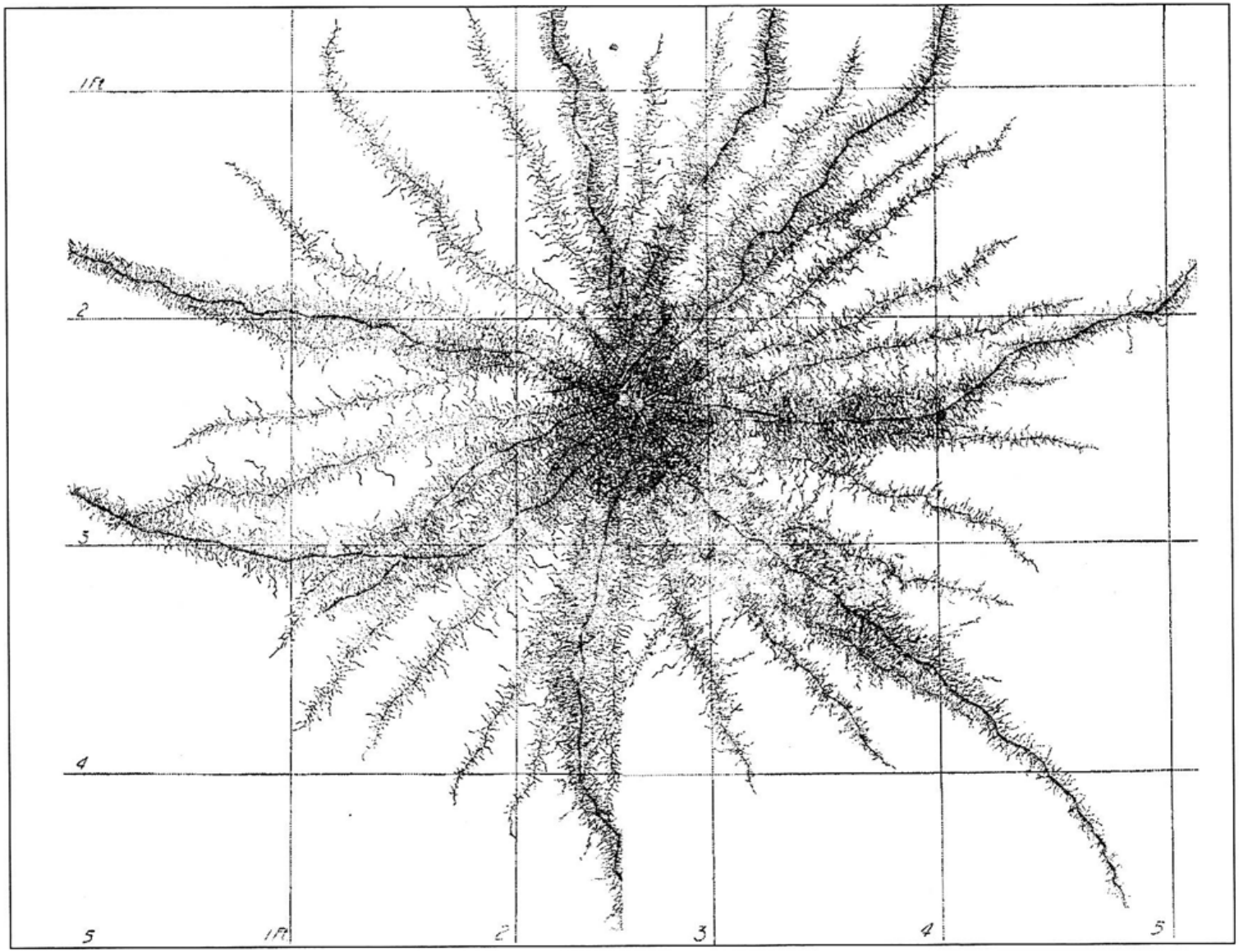


Figure #18: This beautiful diagram re-creates the pattern (seen from above) of corn roots growing in the top six inches of soil.

From *Root Development of Vegetable Crops*, by John Weaver & William Bruner. 1927. Pages 30-31. Grid equals one-square-foot boxes.

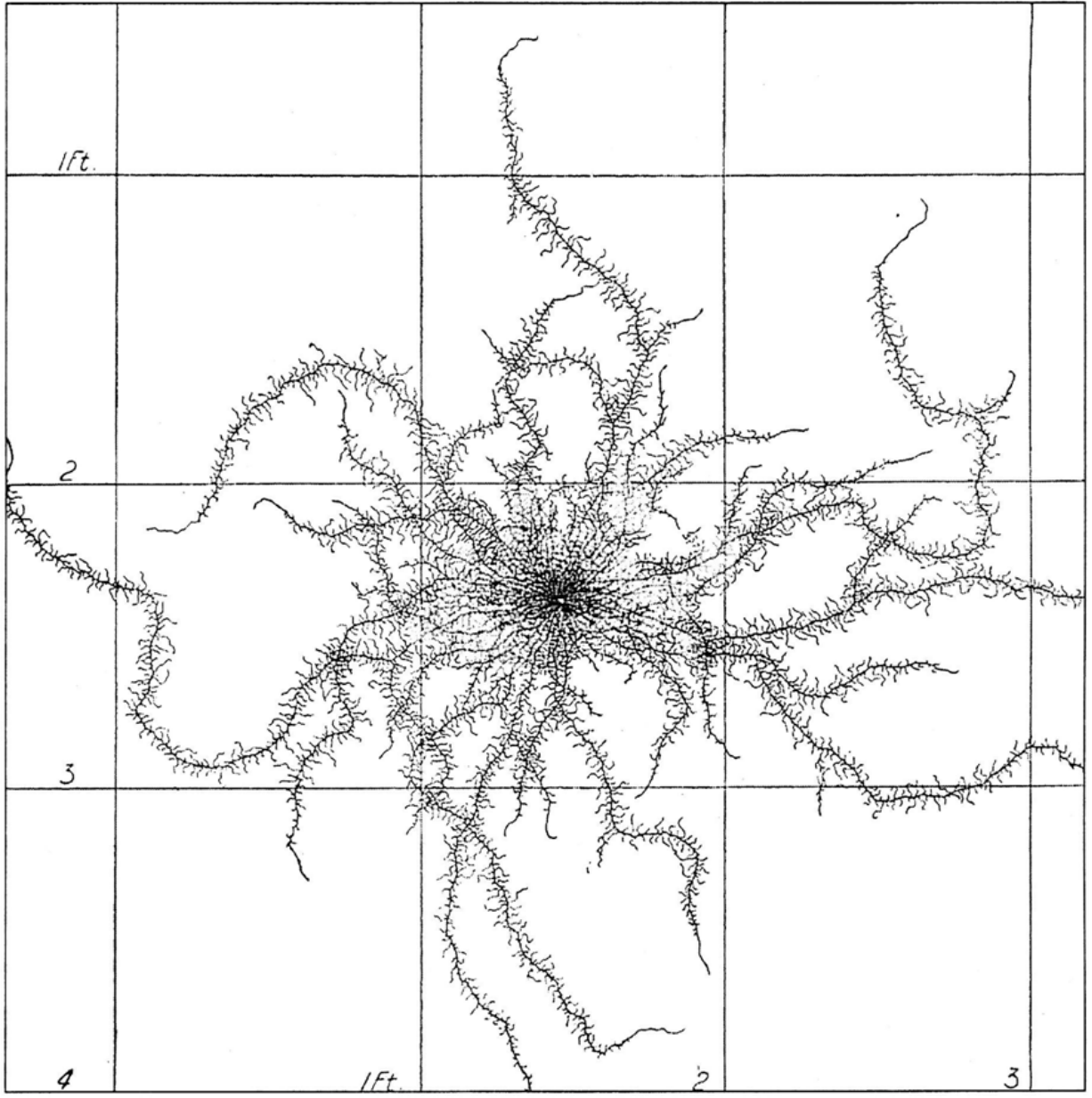
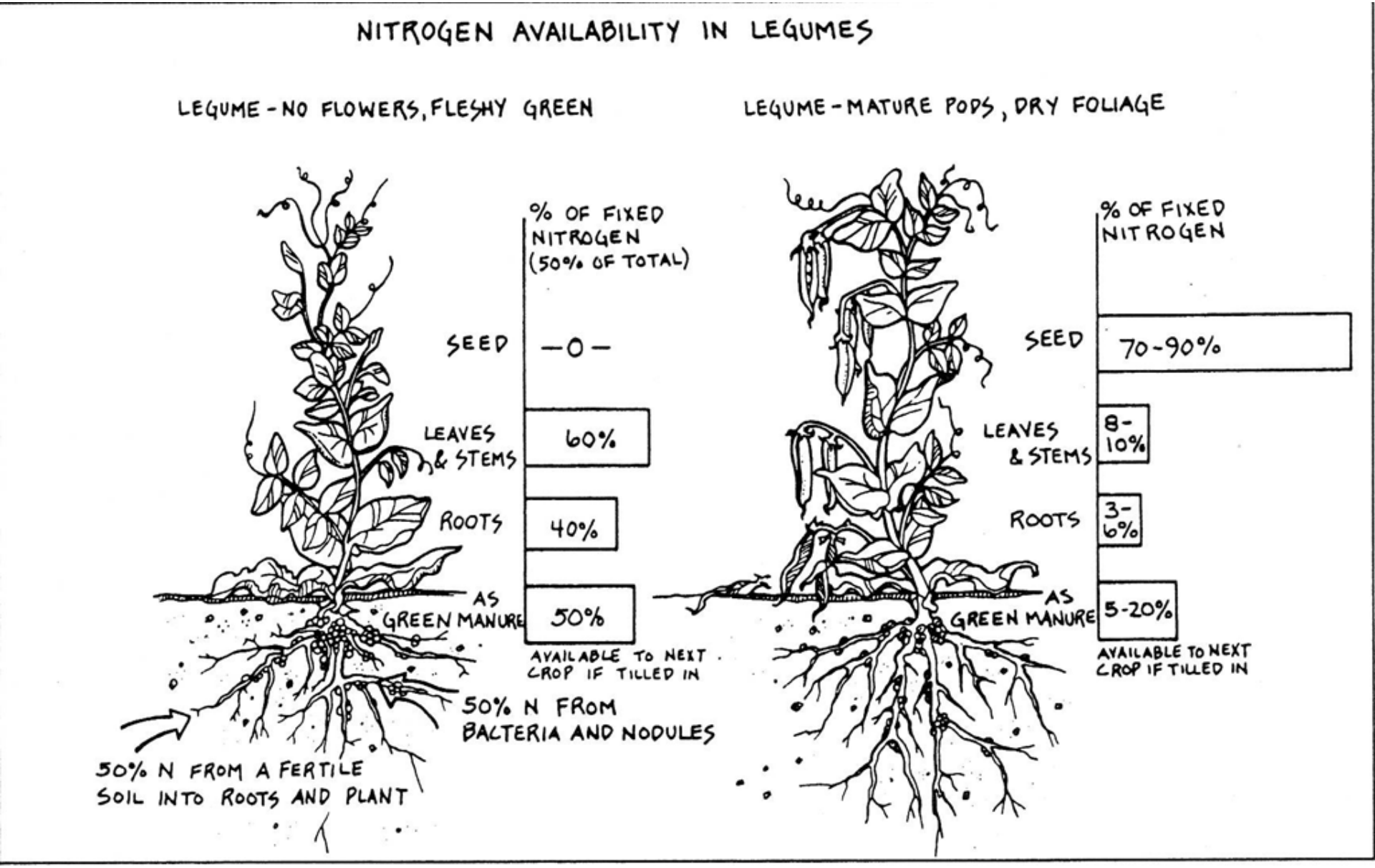


Figure #25: Another fantastic aerial view by John Weaver. This shows the top six inches of the root system of a kidney bean. (As seen on the cover of this book.)
From *Root Development of Vegetable Crops*, by John Weaver & William Bruner. 1927. Page 186. Grid equals one-square-foot boxes.

Rhizobium - symbiotic nitrogen fixation

(Capon, 2005)

Nitrogen fixation – classifying plants according to function



Credit: Roots Demystified

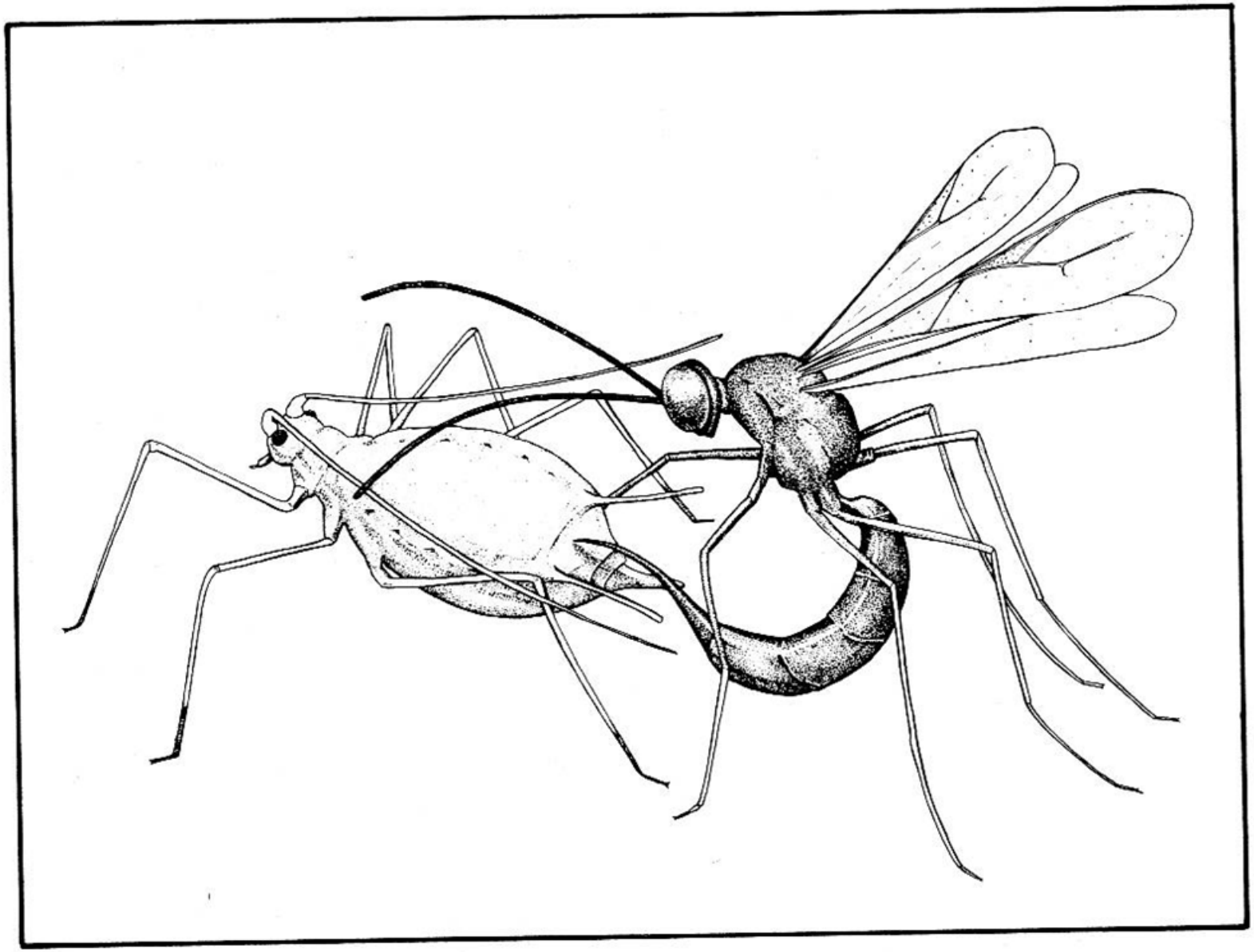
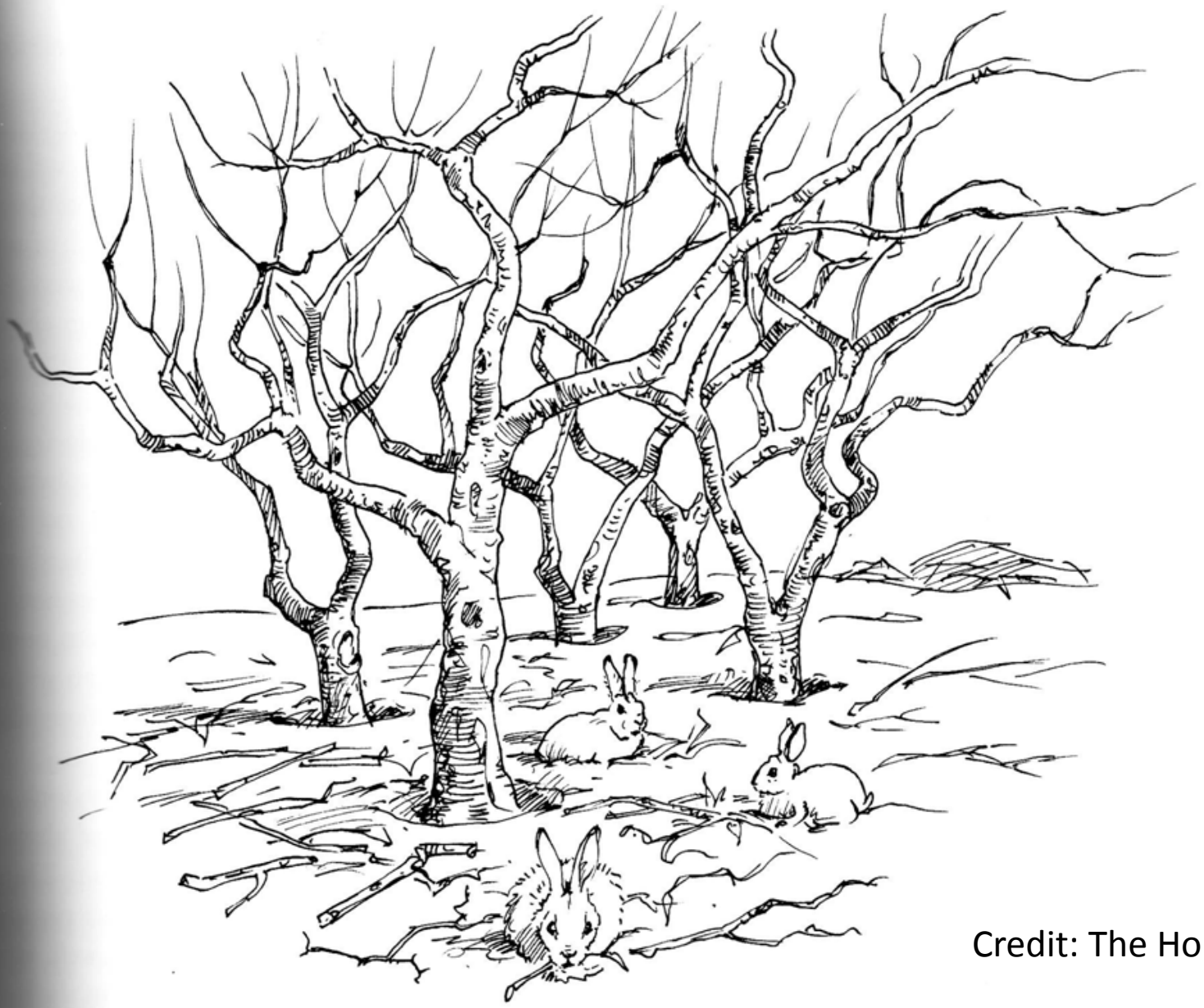


Figure 16.3 A beneficial parasitic wasp inserts an egg into an aphid.



Credit: The Holistic Orchard

...ers with an alternative source of browse ofttimes saves the tree. These rabbits are quite content to clean the bark off prunings thrown into the aisleway.

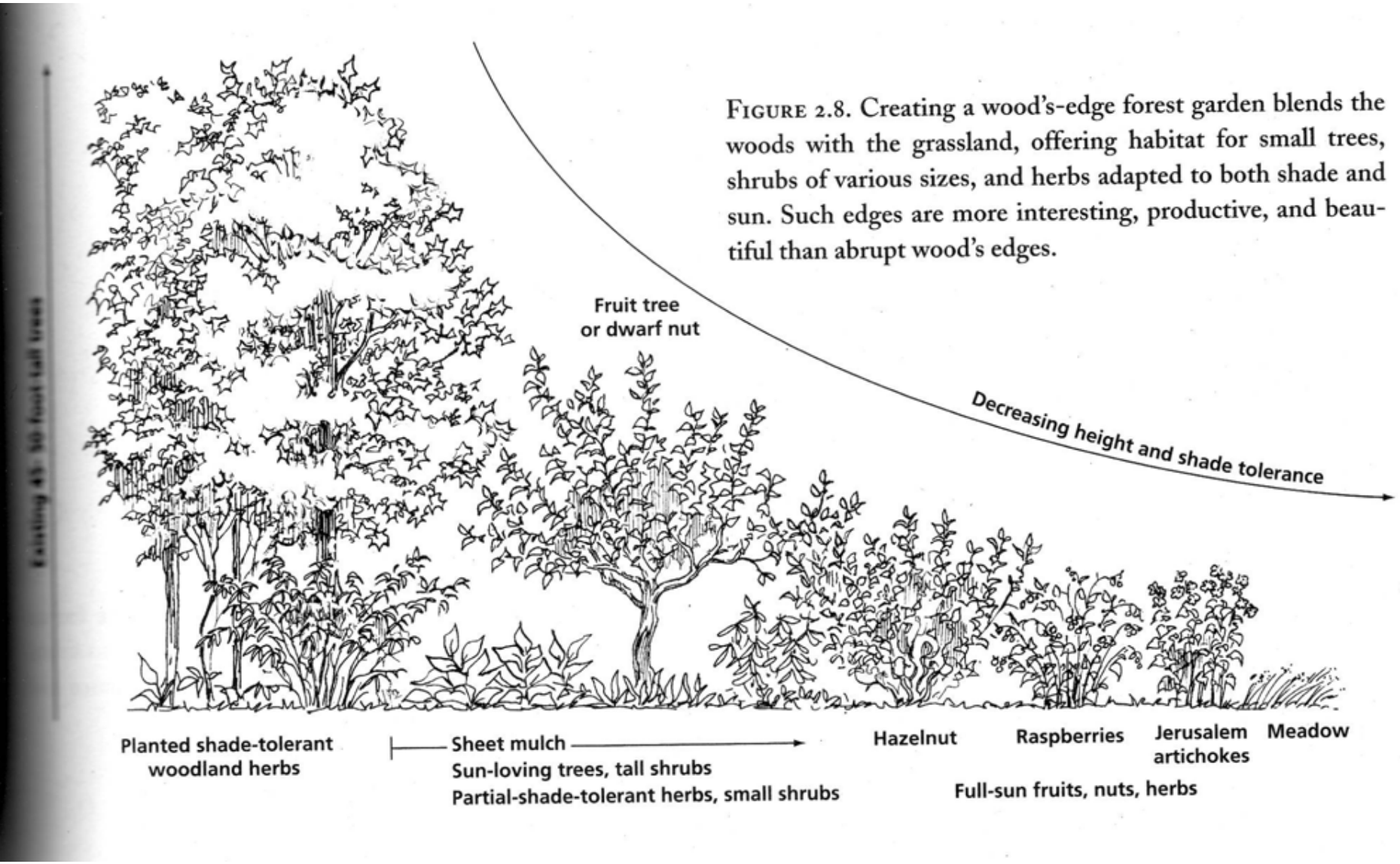
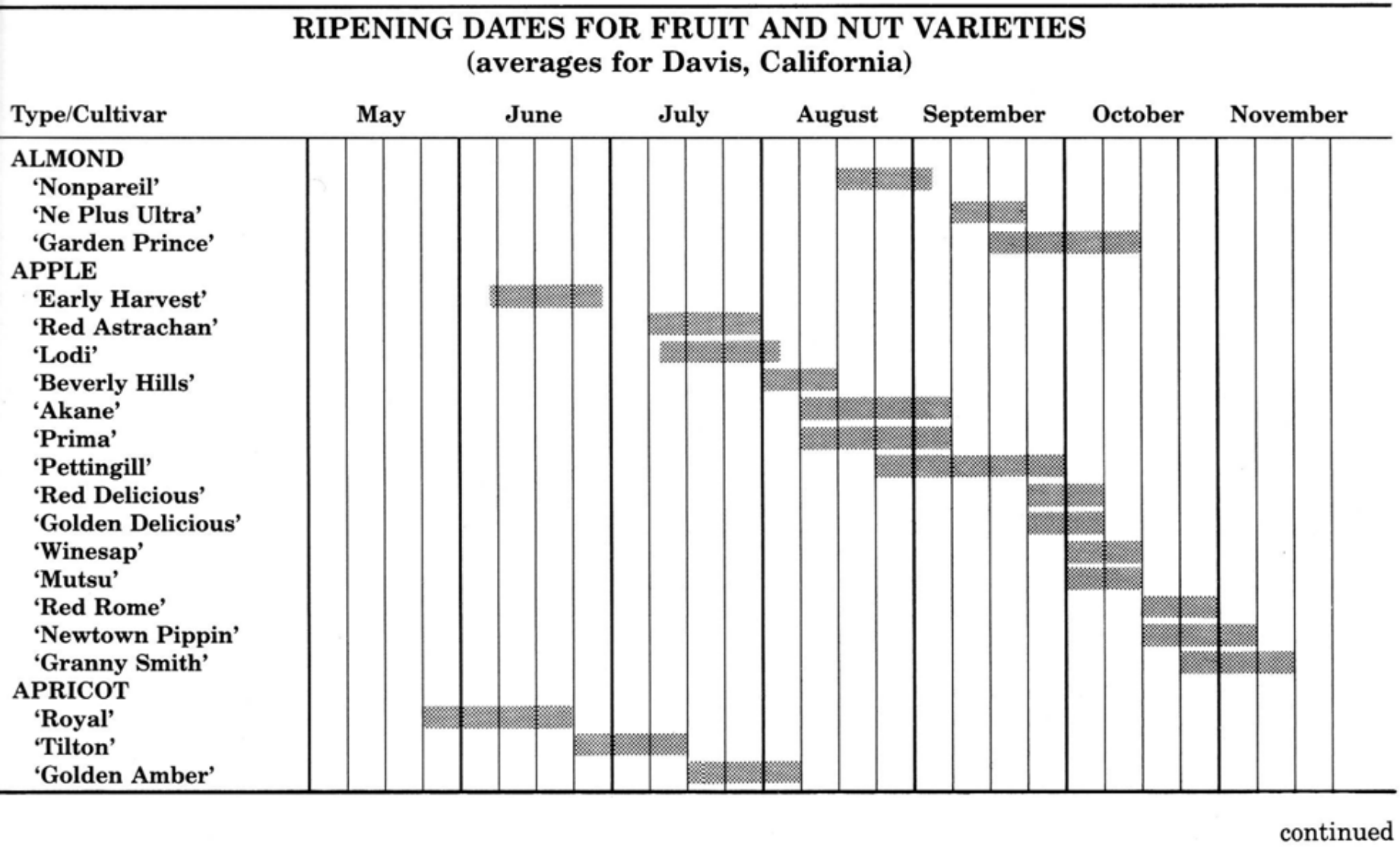


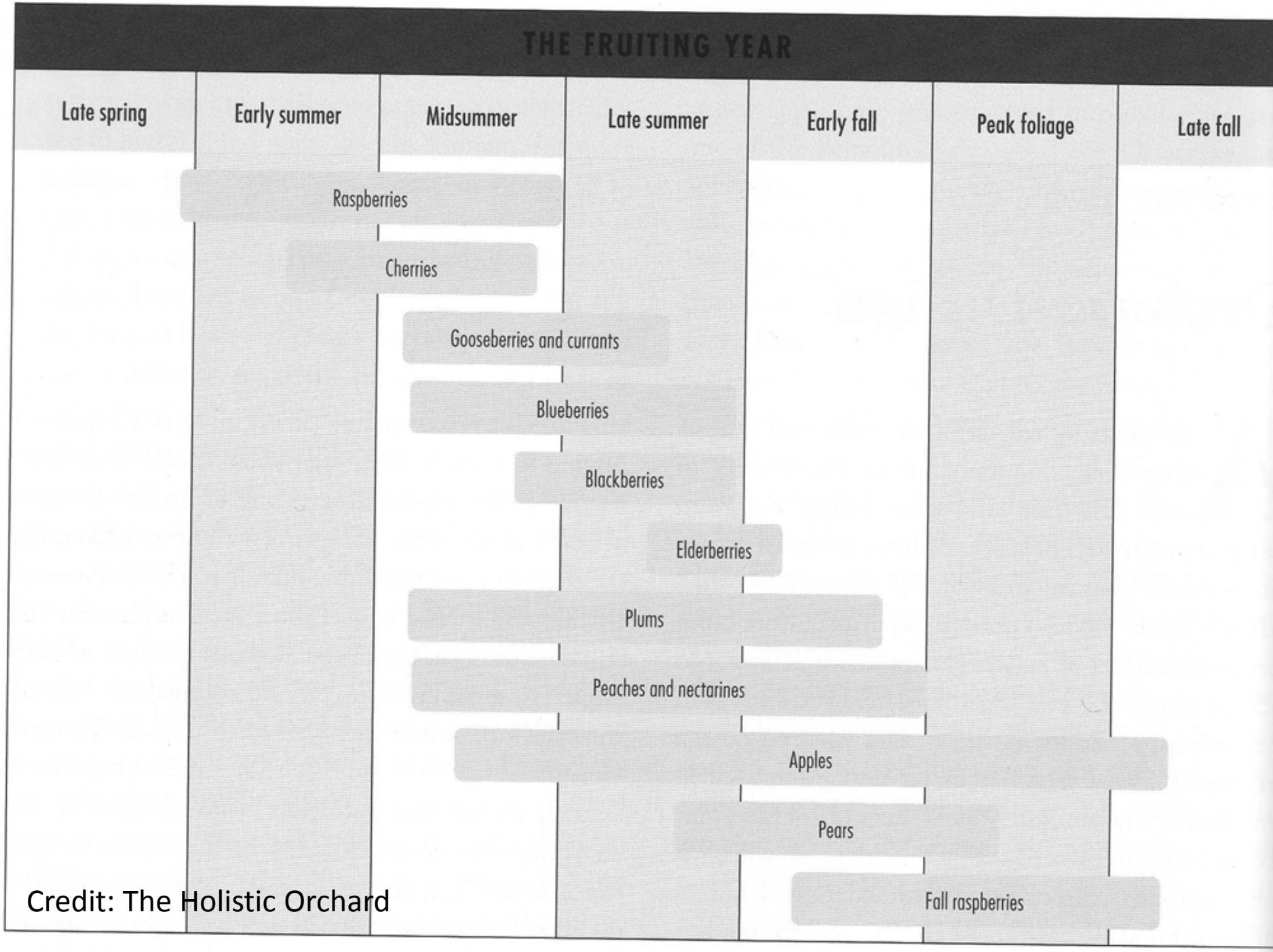
FIGURE 2.8. Creating a wood's-edge forest garden blends the woods with the grassland, offering habitat for small trees, shrubs of various sizes, and herbs adapted to both shade and sun. Such edges are more interesting, productive, and beautiful than abrupt wood's edges.

Credit: Edible Forest Gardens



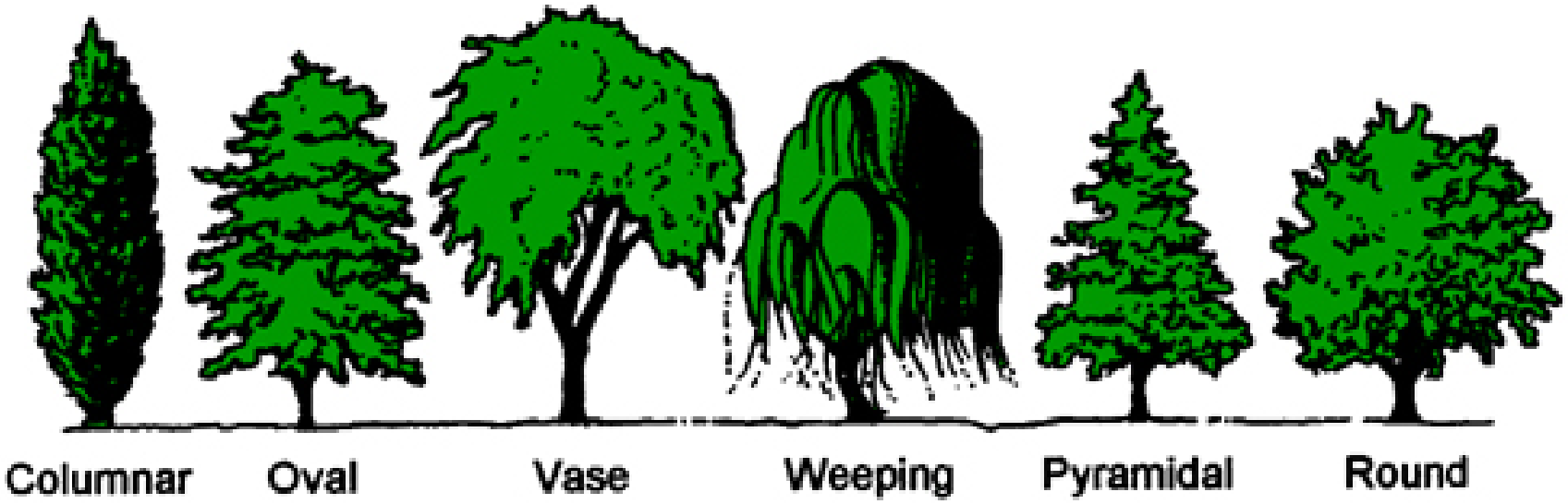
continued

Credit: Designing and Maintaining your Edible Landscape Naturally

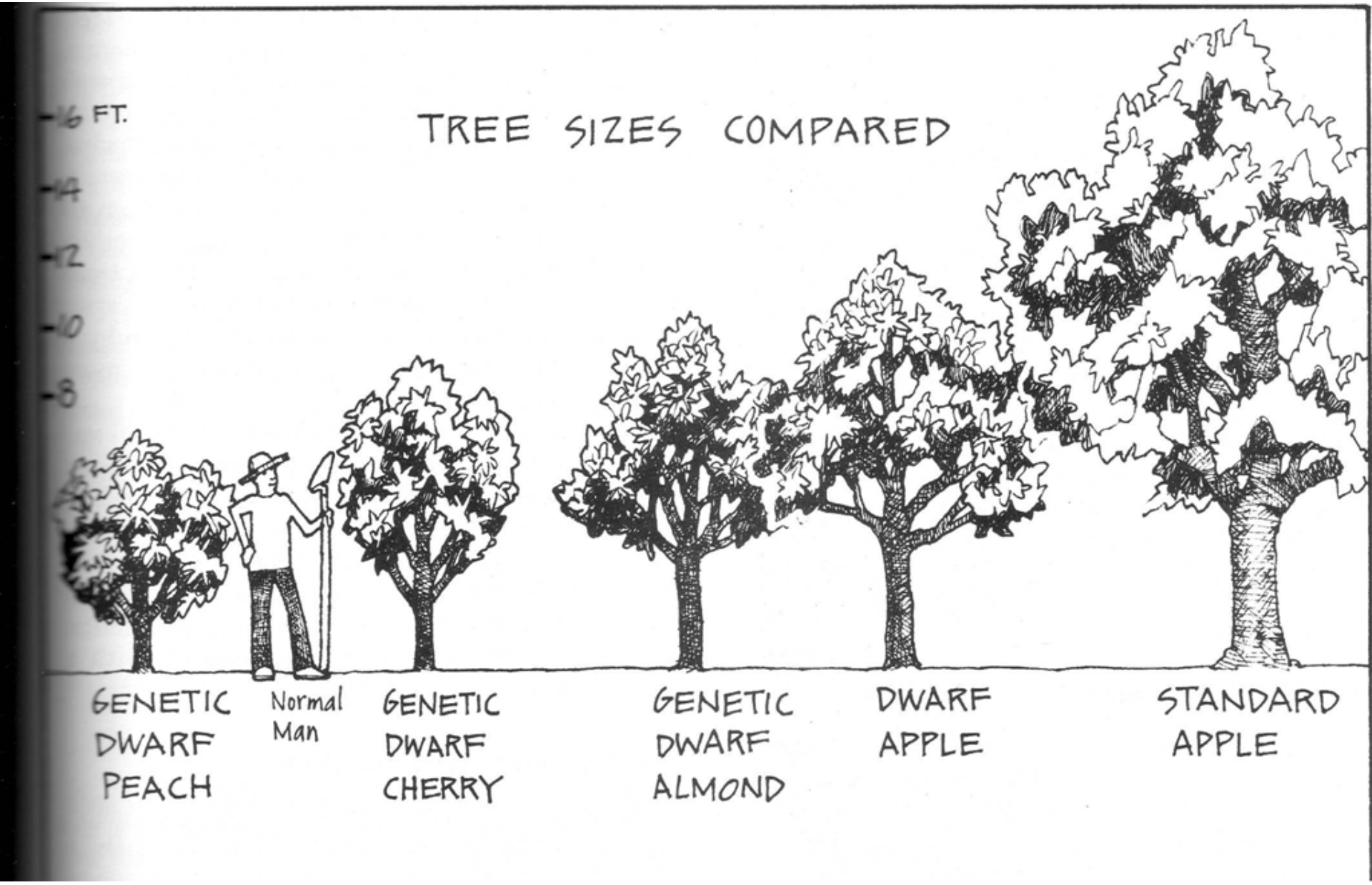


Credit: The Holistic Orchard

Tree Growth Forms



http://www.ext.colostate.edu/mg/gardennotes/121.html



Credit: The Holistic Orchard

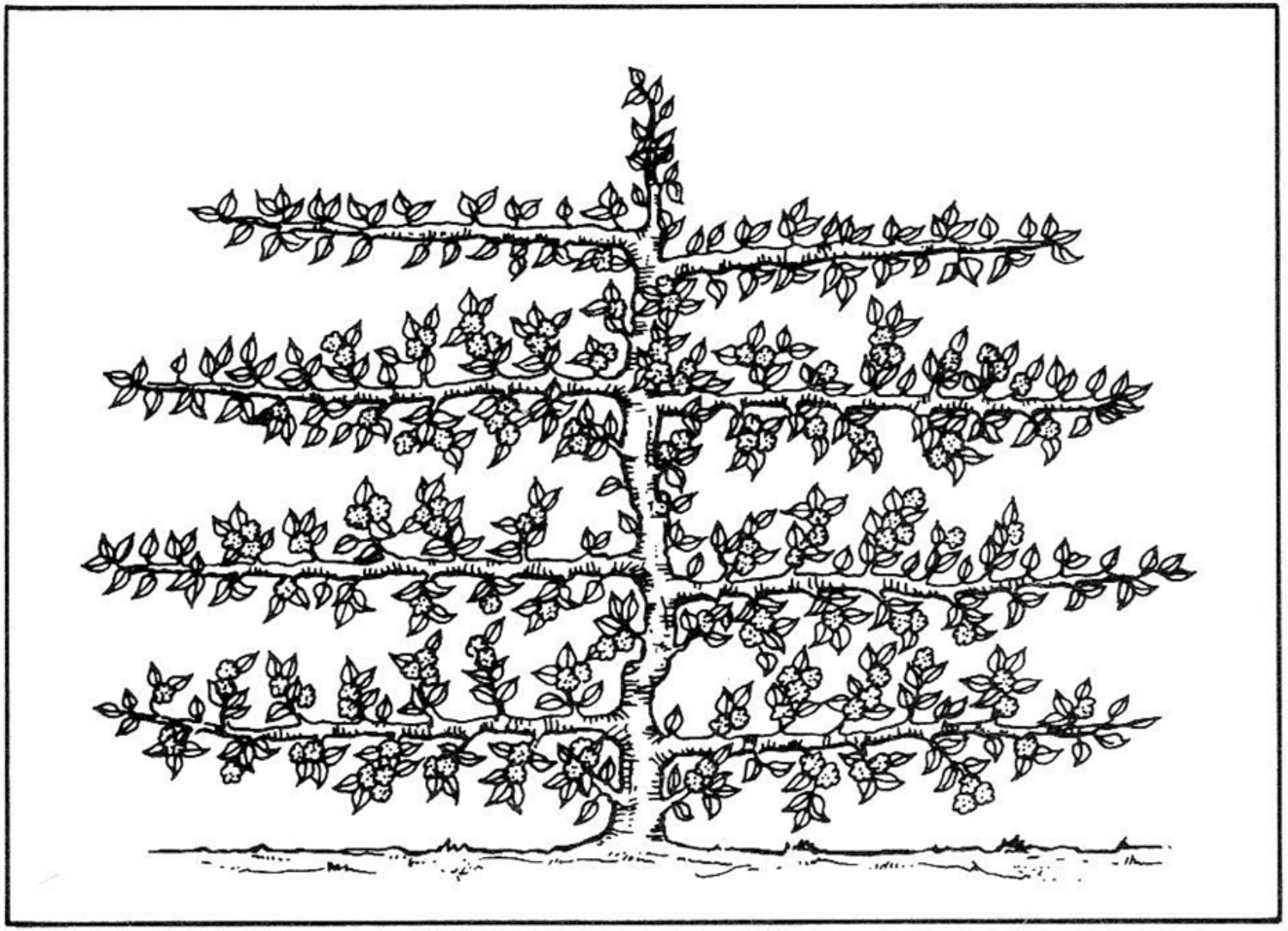


Figure 14.27 A horizontal palmette, or cordon, espalier.

Credit: Designing and Maintaining your Edible Landscape Naturally