Green Gardening: The root of thriving plants is in the soil

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If there is a secret to gardening success, it is this: Grow great roots.

Roots are the key to sustainable gardening and to healthy, thriving plants. Most garden books focus on the production of foliage, flowers and fruit, which are, of course, the pretty and delicious parts. However, terrific top growth is the child of healthy, vigorous roots.

Soil preparation is becoming better understood as soil science improves. Just a few years ago, mainstream agronomists considered soil to be a relatively unimportant medium that held plants upright while the chemical fertilizers worked their magic.

Today, soil building is regaining its place as the basis of sustainable gardening. Agro-chemists believed soil to be less important because, through photosynthesis, plants capture up to 96 percent of their nutrient from sunlight, air and water. If chemical fertilizers provided all plants' needs, poor soil shouldn't matter to farmers or gardeners.

That soil counts for a great deal is proved by falling food nutritive values. That chemical fixes don't work long term is demonstrated by the steady increase of problematic plant pests and diseases.

Sadly, excess nitrogen destroys organic material in soil, so our farm fields grow more nutrient-depleted every year. In some agricultural states, every significant waterway shows nitrification damage. A huge aquatic "dead zone" spreads from Texas to Florida, polluted with agricultural fertilizers and pesticides.

Today, we also know that soil is alive, with a complex soil-food-web of its own. Plant scientists are learning more about roots as well, some from modern research and some from old-time agricultural scientists who worked with undisturbed native plants and soils.

A fascinating new book by Robert Kourik, "Roots Demystified" (Metamorphic Press, 165 pages, $25), will astound, amaze and educate

gardeners who want their gardens to thrive without chemicals. Kourik spent years collecting root drawings that disprove the old theory that a plant's roots are its mirror image.

Instead, Kourik shows us that about 90 percent of a tree's roots are found within the top 18 inches of the soil around it. A sprouting cucumber seed can send its taproot down to 3 feet, growing an inch a day. Every turnip in our garden sends exploring roots into 100 cubic feet of soil, while a lima bean plant may penetrate 225 cubic feet of soil.

Kourik explains a great deal about how roots work, where they live, how they die and are reborn, and what their needs are. We see the role roots play in supporting plant life and in building soil quality.

This is not an intellectual exercise. Chapters on lawns, shrubs, fruit trees, vegetables and ornamentals teach gardeners how to help rather than hinder root growth for each kind of plant. Other sections offer information on soil improvement and how and how *not* to use compost and mulches.

Perhaps not surprisingly, Kourik highly recommends buying plants grown in deep pots or growing tubes instead of the usual nursery cans. Early root development sets the stage for the rest of the life of a tree or shrub, so cramping, coiling and potbound stagnation obviously are not in the best interests of the plant or the gardener.

The section on seeking sources for tube-grown plants is brief but includes some of the best and most exciting nurseries in the country, from Plants of the Wild (Washington) to Forest Farm (Oregon) to Digging Dog Nursery (California).

Kourik is an expert on drip irrigation, and the chapter here is clear and explicit. You'll also find lists of trees and shrubs suitable for growing in lawns (and those that can't take the competition) as well as plants that are susceptible to root rots, such as the dreaded phytophthora.

This book belongs in every serious (or frustrated) gardener's collection.

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