

To Know Thy Soil, Heed Thy Weeds

Weeds may be ugly. They obviously lack social skills, because they're always showing up where they're not wanted. But they are not dumb. They can communicate with each other and they can give us some clues about the general nature of our soil if we know how to listen.

Biodynamic farmer Ehrenfried E. Pfeiffer, author of *Weeds and What They Tell*, has classified weeds into three major groups according to the soil they thrive in: acid, hardpan or compacted soils. Five minor groups indicate sandy, salty, alkaline, limestone and poorly drained soils.

- **Acid Soil.** Clinquefoil, dock, hawkweed, horsetail, knapweed, lady's thumb sorrel.

- **Hardpan or Compacted Soils.** Chamomile, field mustard, horse nettle, morning glory, pennycress, pineapple weed, quack grass.

- **Disturbed or Cultivated Soils.** Amaranth, buttercup, carpet weed, chickweed, dandelion, horehound, lamb's-quarters, mallows, nettle, plantain, prickly lettuce, prostrate knotweed.

- **Sandy Soil.** Asters, most goldenrods, yellow toadflax.

- **Salty Soil.** Russian thistle, sea aster.

- **Alkaline Soil.** Sagebrush, woody aster.

- **Limestone.** Field madder, pennycress, peppergrass and wormseed.

- **Poor Drainage.** Hedge bindweed, Joe-Pye weed, meadow-pink, mild water pepper, smartweed, swampy horsetail, white avens.

Stuart Hill, a soil ecologist at the Macdonald campus of McGill University in Ste-Anne-de-Bellevue, Quebec, has made similar observations. For instance, if fertility is poor, deep rooted weeds—ragweed, daisy, mullein, Queen-Anne's-Lace, mugwort, dandelion, wild radish and wild carrot—will thrive. "These weeds penetrate deep into the earth looking for nutrients," he told *Canadian Gardening*. "The dandelions, it means the soil on the surface lacks nutrients such as calcium. The solution is to improve fertility, not zap the lawn with herbicides."

Improving fertility doesn't mean a weedless plot. Healthier soil welcomes other messengers—hallow-rooted weeds like chickweed, chicory, common groundsel and lamb's-quarters. "If these weeds start to appear in your garden after you've added humus and compost, it means the fertility is improving," Hill said.

Hill says weeds can also indicate what's missing in the soil. For example, a heavy growth of clover, vetch or other leguminous weeds often indicates a soil deficient in nitrogen, at least under natural conditions. In his book *Designing and Maintaining Your Edible Landscape Naturally*, Robert Kourik observes: "Legumes also grow in nitrogen-rich soils, as you can prove by growing beans in your garden."

Legumes fall into a category of plants that accumulate a mineral even in soils that have a low concentration of that mineral. A second group of plants, Kourik writes, "thrive in soils with high concentrations of certain minerals or send their roots down to layers where the nutrients are in abundance. The concentration of minerals in their tissues is related more to the soil than to their powers as accumulators. These plants tolerate conditions in the soil that might be toxic to other plants."

Kourik compiled the following list of accumulator weeds from his own observations and those of other researchers. Grown in or around the landscape, these weeds can correct soil nutrient problems. Because plants hoard the substances they accumulate for the next generation, the weeds need to be tilled under at the end of the growing season:

- **Boron.** Spurge.

- **Calcium.** Chicory, coltfoot, corn chamomile, creeping thistle, dock, German chamomile, garden sorrel, horsetail, lamb's-quarters, plantain, purslane, redroot pigweed, sheep sorrel, shepherd's-purse, silverweed, stinging nettle, toadflax, watercress.

- **Cobalt.** Eastern bracken, horse-tail, vetch.

- **Copper.** Coltsfoot, dandelion, eastern bracken, plantain, purslane,

silverweed, sow thistle, stinging nettle, vetch.

- **Fluorine.** Garlic, watercress.

- **Iodine.** Bladderwrack, burdock, Canada thistle, coltsfoot, creeping thistle, dandelion, devil'sbit, dock, eastern bracken, nodding thistle, plantain, redroot pigweed, Russian thistle, stinging nettle, toadflax, watercress.

- **Magnesium.** Bladderwrack, coltsfoot, dandelion, devil'sbit, horsetail, sow thistle, toadflax, watercress.

- **Manganese.** Chickweed, eastern bracken, lamb's-quarters.

- **Nitrogen.** Cattail, lamb's-quarters, stinging nettle.

- **Phosphorus.** Chickweed, clover, dandelion, dock, eastern bracken, garden sorrel, garlic, German chamomile, lamb's-quarters, purslane, redroot pigweed, sheep sorrel, vetch, watercress.

- **Potassium.** Chickweed, chicory, coltsfoot, corn chamomile, creeping thistle, dandelion, dock, eastern bracken, German chamomile, lamb's-quarters, plantain, redroot pigweed, silverweed, sow thistle, stinging nettle, tansy, vetch, watercress.

- **Silica.** Dandelion, horsetail, plantain, valerian.

- **Sodium.** Dandelion, garden sorrel, sheep sorrel, stinging nettle, shepherd's-purse, watercress.

- **Sulfur.** Coltsfoot, garlic, plantain, shepherd's-purse, stinging nettle, watercress.

Before looking to your weeds as divining rods, remember that, in Kourik's words, "one individual plant says nothing." Others who have studied weeds and their relationships to the soil echo his observation that individual plants can grow in atypical situations and many species tolerate a wide range of soil conditions. If your weeds are sickly and undersized, they're probably not growing in a favorable habitat.

But healthy, lush plant communities—more than one plant of a single species along with other indicator plants—may be a useful signal of soil type, Kourik says. "It's

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Course Management—

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tal and physical aspects of the game, golf adds a third dimension—the course itself. **And in the case of golf, the playing “field” is equally as influential on the outcome as the other two aspects.**

All this leads to an obvious conclusion. A course should be set up commensurate with the skills of those who are to play it. In a USGA championship, the players are all exceptionally skilled and the course can and should be set up appropriately. However, daily play on courses will involve players from one end of the talent spectrum to the other. A middle ground must be established so that everyone can find something they enjoy. Let's all face facts here. Few if any players at the club level play as well as the folks they see on TV. They may think they want the same conditions, but they would quickly find they are not up to the challenge. You know those flatbellies that sit in the 19th hole and watch the pros putt on greens with speeds over 10 feet, and then think the greens at their course should be the same? I often wonder how they drive home after watching the Indy 500 on TV.

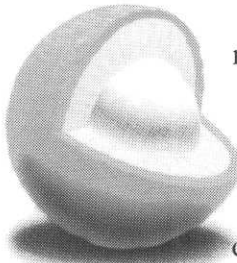
ISSUE #4

“Can we have championship conditions even if we want them?”

The next issue is one that I feel is perhaps the most crucial. Most superintendents realize that the conditions seen on TV during a major championship simply cannot be maintained for an extended period of time. Unfortunately, many players have virtually no knowledge of the steps necessary to produce such conditions. Starved greens, microscopic cutting heights, unlimited labor and equipment and the course dried to the bone are not conditions that can be maintained for more than a few days at a time in most climates. This is truly “Management On The Edge” (Refer to the *Green Section Record* article of July, 1987 by the same name). It takes months and years to prepare a course for a major championship. Often, the complete reconstruction of greens and tees, reshaping of fairways, and yes, even the removal of trees that have been allowed to ruin the architecture of a classic design, must be accomplished prior to the event. Attempting to maintain championship conditions on a daily basis would destroy most courses.

As the Green Section staff travels the country, we often find ourselves explaining these facts to those present on the tour of the course. We also frequently visit clubs that are “pushing” the course way too hard in an effort to provide championship conditions. As a result, we often make recommendations to raise cutting heights, fertilize more and accept slower greens. These recommendations are in direct contrast to preparations for an Open. Is this “two-faced?” **No, it's just common sense.**

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Weeds—

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pretty clear when you see a good stand of dock that the area gets flooded during the year,” he says. “Basically, if you've got dock, don't plant your vegetables there.” But weeds, he added, “can't replace a soil test.”

—*American Horticulturist*,
March 1993

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