a voice
for the natural
landscaping
movement

Wild Ones®
Native Plants, Natural Landscapes

Reprinted from the
*Wild Ones Journal*,
May/June 2008 issue.

For more information, or to join Wild Ones Natural Landscapers, here's how to reach us:

**Phone**
(920) 730-3986
(877) 394-3954 (Toll-Free)

**Mail**
P.O. Box 1274
Appleton, Wisconsin 54912-1274

**E-Mail**
ExecDirector@for-wild.org

**Web Site**
www.for-wild.org

The membership fee is just $30 per year – and it's tax-deductible.

Working toward our next 25 years restoring native plants and natural landscapes.

# A Mystery Explored

By Maryann Whitman

***It's All One Piece***

Landscaping practices as promoted by Wild Ones have far-reaching implications, with beneficial effects on biodiversity and atmospheric carbon dioxide. ¶ Identification with Wild Ones suggests more than our mutual attraction to growing native plants. Even non-gardeners may be attracted to the ecologically sound idea of native plants. Whether we live in a high rise, on a city lot, or on acreage, we recognize the complex, dynamic interactions among plants, animals, and the ecosystems they inhabit. Whether we are attracted to raspberries, ferns, insects, birds, or orchids, we recognize the natural environment as all one piece. When the dynamically stable connections among the components – however defined – are broken, there is a danger that the entire system will deteriorate and break down. We humans are a species contained within and reliant on that delicate system. ¶ With last issue's presentation of Douglas Tallamy's book, *Bringing Nature Home,* the *Wild Ones Journal* has embarked on a series of articles that will shed a bright light on the impact of our landscaping choices. It's quite clear that we don't claim enough credit.

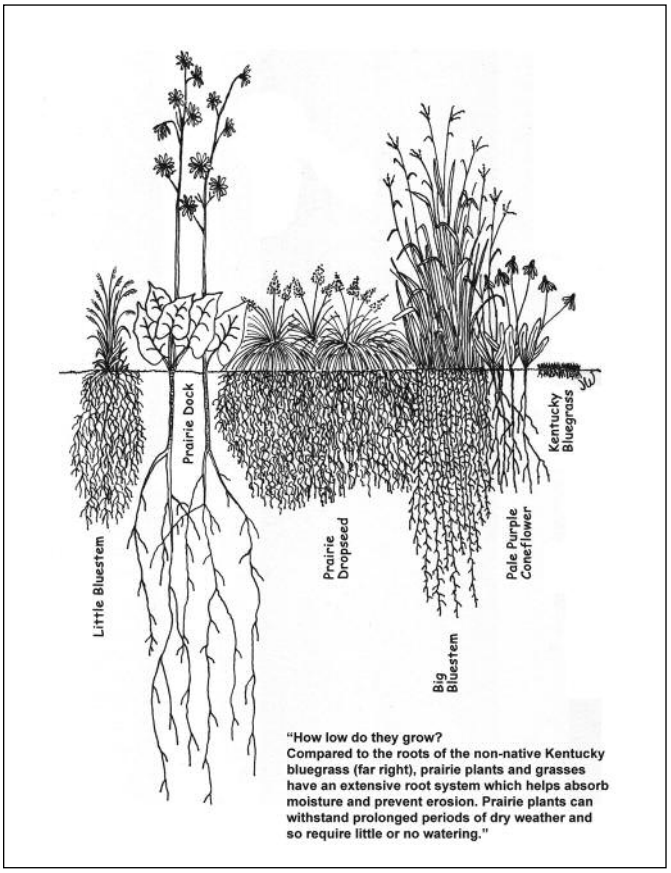
Have you ever wondered why, specifically, we can say that native plants do not need to be fertilized or, for that matter, have any chemicals thrown at them? Is it something inherent in the plants? Is it something that we, the native planting caretakers, do, or don't do? Is it something about the medium they grow in? All are good possibilities.

**Is it something inherent in the plants?**

One of the first qualities that we mention about native plants is their roots – they are extensive, and some are capable of growing very deep into the soil. We have drawings that we show to skeptics, comparing the roots of a handful of common natives with the roots of Kentucky bluegrass, the typical lawn grass. The native plant roots are dense and fibrous, and they have an average depth of 8 to10 feet (to the best of our knowledge). For the most part, natives are perennials; once they are established, their lives span decades. In the wild, native plants tend to grow in communities that share space – above and below ground, nutrients, water, and sunlight over the time of a growing season.

Roots that are extensive, that grow to great depths, and have longevity, introduce life-supporting functions to areas of the soil that do not usually entertain such activity. The growing roots exude sugar solutions and release gases that are the byproducts of their life processes. They are constantly sloughing off cells and dying off, thereby introducing humus and organic molecules to great depths in the soil. They are breaking into hard soil with the slow, persistent pressure of their growth. When they die, the spaces their bodies occupied form ducts for life-supporting water and gas exchange, and micro-tunnels for small organisms. *Continued on page 2.*

*Continued from page 1.*




Drawing by Lucy Schuman.

A vast proportion of other plants grown on this continent are annuals (agricultural/food crops, landscaping bedding plants), which are not genetically predisposed to devoting much energy to root growth. Their drive is to produce fruit before they die at the end of the growing season. Lawns which occupy hundreds of thousands of acres, while perennial, are managed, and typically do not extend more than 6 inches into the upper soil.

**Is it something that we do?**

What is done differently in the practice of growing native plants? We burn our native plantings periodically, returning nutrients bound up in the bodies and duff to the soil. We may mulch-mow the plantings at the end of the growing season, or just let the dead plant material stand into the next growing season; either way the dead organic material is permitted to disintegrate into the soil. When establishing a native planting on previously broken soil, recognizing that this soil may be lacking in humus, we may add organic matter in the form of compost or wood chips.

**Otherwise, what matters most is probably what we do *not* do:** We do not disturb the soil in the root zone; we do not till, fertilize, or use chemicals.

These management techniques are very different from those used in the typical flower beds or in some agricultural fields. Most agricultural fields and food-plant gardens are tilled annually. The same is often true for displays of bedding plants. To induce maximal production in the shortest period of time, they are fertilized heavily with chemical salts – the plants are protected from pests with panoplies of pesticides – and herbicides are used to prevent competition from "weeds." Except for the tilling, this latter management regimen is used with lawns and with beds of perennial exotics.

**Is it something about the soil they grow in?**

With this question we get closer to our answer, especially in light of the answers to the previous questions.

When we think of the "Web of Life" or the "Food Web," we think of lions and tigers and bears. We think of the birds and the bees, and we think of all the animals that are going extinct in the rain forests. In recent decades more and more information has been published about the "Soil Food Web" and its various trophic levels (who eats what or whom). The density and biodiversity of life in healthy soil rivals the diversity we are aware of above ground.

Dr. Elaine Ingham of Oregon State University presented a concise picture in her presentation given on July 18, 1998, at the First Grassroots Gathering on Biodevastation: Genetic Engineering.

> "What do we mean, organism-wise, when we talk about soil? Agricultural soil *should* have 600 million bacteria in a teaspoon. There *should* be approximately 3 miles of fungal hyphae in a teaspoon of soil. There *should* be 10,000 protozoa and 20 to 30 beneficial nematodes in a teaspoon of soil. No root-feeding nematodes. If there are root-feeding nematodes, that's an indicator of a sick soil. There *should* be roughly 200,000 microarthropods in a square meter of soil to a 10-inch depth. All these organisms *should* be there in a healthy soil.
>
> "If those conditions are present in an agricultural soil, there will be adequate disease suppression so that it is not necessary to apply fungicides, bactericides, or nematicides. There should be 40 percent to 80 percent of the root system of the plants colonized by mycorrhizal fungi, which will protect those roots against disease.
>
> "What happens when you apply most fungicides and pesticides to soil? In every single case where we have looked at food web effects of pesticides, there are non-target organism effects, and usually very detrimental effects. The sets of beneficial organisms that suppress disease are reduced. Organisms that cycle nitrogen from plant-not-available forms into plant-available forms are killed. Organisms that retain nitrogen, phosphorus, sulfur, magnesium, calcium, etc. are killed. Organisms that retain nutrients in the soil are killed. Once retention is destroyed, **where do those nutrients go? They end up in our drinking water; or end up in our ground water.** You and I as taxpayers have to pay in order to clean that water so we can drink it.
>
> "*If* you grow the proper number and types of bacteria, fungi, protozoa, nematodes, micro-

*Continued on page 3.*

*Continued from page 2.*

arthropods, and mycorrhizal fungi in the root systems of the plants, you can do away with pesticides. It's been done. We can reduce significantly the amount of fertilizer that goes into that soil. In experiments that have been done all over the country, all over the world, inorganic fertilizer inputs have been reduced, or are not added at all, without reduction in plant growth.

"*If* garden soil is healthy, there will be high numbers of bacteria and bacterial-feeding organisms, which means the beneficial, disease-suppressive organisms will be present. If the soil has received heavy treatments of pesticides, chemical fertilizers, soil fungicides, or fumigants that kill these organisms, the tiny critters die, or the balance between the pathogens and beneficial organisms is upset, allowing the opportunist, disease-causing organisms to become problems. *If the soil is healthy for the type of vegetation desired, there should be no reason to use pesticides, or fertilizers."*

To her testimony might be added the fact that tilling, or any organized disturbance or compaction of the root zone, disrupts the ebb and flow of the web of life in the soil. The life spaces of the micro-critters are torn apart, as are the critters themselves. Webs of mycorrhizal fungi are disconnected and sundered. The gaseous content of the soil is changed, affecting the chemistry within the soil, and carbon dioxide is released into the atmosphere. On a continental scale this is what happened when the prairies were broken in North America, the steppes in Eurasia, and the llanos in South America.

The soil food web and native plants are increasingly being recognized as relevant in research into agricultural methods and food production, water quality, air quality, soil quality, invasive species, and most recently bio-energy.

In coming issues of the *Journal* we will discuss soil biodiversity, soil food-web interactions, and the resultant biochemistry. We will elucidate some baffling terminology like "carbon sequestration," "nitrogen fixation," "mineralization," "immobilization," and "photosynthesis." These terms and concepts are essential to understanding how to develop a sustainable lifestyle in our yards and in our plant environment. Through our understanding of our environment and our acceptance of responsibility for that environment, we address the Siamese-twin issues of increasing atmospheric carbon dioxide and climate change – possibly the ultimate destroyer of the delicate life web we depend on.

It seems that in promoting the use of native plantings in our landscapes we Wild Ones are accomplishing much more than we have given ourselves credit for. ⁕

Conservation is a state of harmony between men and land. By land is meant all of the things on, over, or in the Earth. Harmony with land is like harmony with a friend; you cannot cherish his right hand and chop off his left. That is to say, you cannot love game and hate predators; you cannot conserve the waters and waste the ranges; you cannot build the forest and mine the farm. The land is one organism. Its parts, like our own parts, compete with each other and cooperate with each other. The competitions are as much a part of the inner workings as the cooperations. You can regulate them – cautiously – but not abolish them. Aldo Leopold, 1949, *A Sand County Almanac.*