The Plant Doctor's LANDSCAPE TIPS

By David L. Roberts, Ph.D., *Senior Academic Specialist, College of Agriculture and Natural Resources, Michigan State University*

Photo 1: A family of diverse lichens has colonized the bark's surface of this tree on lake front property in northern Michigan. Contrary to many people's concerns, lichens do not in general harm or kill plants; they simply grow on the surface of live and dead plants as well as on inanimate objects.

Photo 2: Lichens have found a nice surface and environment by growing on the surface of this metal roof.

SHE LICHENS ME; SHE LICHENS ME NOT

INTRODUCTION:

"She lichens me, she lichens me not" ..., or so goes the variation on the old romantic theme, "She loves me, she loves me not ...". Of the vast array of questions I receive every year about trees and landscapes, one of the most common topics involves lichens. It is not uncommon for concerns to be expressed by the general public that an awful looking growth is killing their trees and shrubs.....usually followed by how do we get rid of it? That "awful growth" is often lichen (Photo 1). Lichens will growth on practically any surface, whether natural or human made: roofs (metal, cedar shakes, asphalt), soil, rocks, gravestones, trees, shrubs, firewood, fences (plastic or wood), and even slow moving cars ... just kidding! (Photos 2, 3, 4 and 5).

Yet, we never hear that these awful growths are killing our roofs or our rocks! So, are lichens something to be feared? Should lichens be controlled or zapped with some sort of pesticide? Are they really killing our trees and shrubs? Because we often see lichens on declining or dead trees and shrubs, is it safe to assume that the lichen has killed these plants?

WHAT ARE LICHENS?

Lichens are an interesting phenomenon in our natural world. Lichens represent a "marriage" between a fungus (mycobiont) and green algae (phytobiont) or bluegreen algae (cyanobacteria). In a general sense, a fungus (plural: fungi) is an organism such as a mold, more commonly manifested by the mushrooms we see in woods and/or eat on our pizzas and in our salads. An alga

Continued on page 10

Photo 3: According to the size of the lichens on the cedar shakes of this squirrel feeder, they have been growing there for quite a few years.

The Plant Doctor's LANDSCAPE TIPS

SHE LICHENS ME; SHE LICHENS ME NOT

Continued from page 9

(plural: algae) is represented by that green, filamentous or single celled "slime" we often see in stagnant ponds. Bluegreen algae (cyanobacteria) are actually bacteria and not algae; they can fix nitrogen from the atmosphere much like leguminous plants do. There are numerous types of fungi and algae in the natural world. Some of these fungi and algae (or bacteria) come together to form that marriage we call "lichen." Actually, there are many types of lichens representing many different sizes, textures and colors. In the lichen household, the alga and fungus form what most scientists believe is a "symbiotic" relationship, which we often describe as symbiosis, but which is more properly termed "mutualistic symbiosis" (both benefit from the association). It is believed that the fungus provides an anchor (on a branch or rock) and protection from high light intensity to the alga while the alga, via photosynthesis, provides some nutrients to the fungus, and vice versa. However, some scientists believe that the fungus actually parasitizes the alga; the fungus can actually cause the alga component to leak nutrients so the fungus can absorb them. Scientists have studied and continue to study the unique aspects of lichens and their rather unusual relationship. Lichens often are called by common names such as "Reindeer Moss" or "Icelandic Moss," even though they are not mosses or plants. Unlike plants, lichens do not have roots to absorb water and nutrients-they simply used surfaces to grow on and absorb water and nutrients from the air. Lichens are often described as "living in thin air." However, lichens are like plants in that they do photosynthesize and produce their nutrients using sunlight. Lichens have been used to make perfumes and dyes as well as medicines. They also accumulate lead and other heavy metals, performing natural bioremediation for us.

Photo 4: Lichens have heavily colonized the asphalt shingle roof of the author's tool shed. Lichens generally grow where there's some shade and moist conditions. This side of the roof of this building is partly shaded, an ideal environment for lichens; the other side is in full sun and exhibits little lichen growth.

Photo 5: Lichens have found a suitable surface to inhabit on this old gravestone dating back to the mid 1800s.

SOME INTERESTING FACTS ABOUT LICHENS:

There are about 20,000 different species of lichens. Who would know about this vast array of species and why would anyone want to study them? Well, lichenologists study lichens because they liken likens! While we often think of lichens as a relationship between a fungus and an alga, they may have more than two partners. For example, there may be a fungus, green alga and bluegreen algae….a threesome of sorts. Or there may be a filamentous fungus with an alga plus yeasts (single celled fungus). Lichens may grow in a multitude of environments ranging from sea level to very cold alpine environments. Many have lost the ability for sexual reproduction but are still able to replicate just fine, thank you. Lichens are very slow growing, about 0.5 to 1mm per year, and are among the oldest living organisms on the planet. In fact, their long life span and slow growth can be used to date events in history (lichenometry), much like dendrology (study of tree rings) is used to reveal past environmental events. In disturbed environments, such as avalanches, fires and floods, lichens are among the first organisms to recolonize….rocks and soil for example. Lichens have adapted to survive extremes in environmental conditions. For example, they can be completely dried out and still return to normal function when moisture is present again. The European Space Agency performed an interesting experiment where lichens were exposed to the vacuum and harsh conditions of space for 15 days. The lichens recovered nicely when returned to normal earth atmospheric conditions,…possibly proving that lichens will survive on this planet long after we humans have destroyed ourselves.

Photo 6A: This Colorado blue spruce tree, typical of many spruce trees in Michigan, is exhibiting decline from a variety of issues, including diseases and pests.

Photo 6B: It is somewhat natural for many of us to assume that the lichens covering the branches of the spruce tree in Photo 6A is the cause of the decline. Untrue.

TREES & LICHENS:

Lichens are often noticed by the general public on trees and shrubs…especially during the dormant season when the plant's foliage does not mask them. Lichens tend to inhabit plants that are slow growing, under stress, in decline or dead (Photo 6A); hence, it is relatively easy to understand why many individuals believe that lichens are killing their beloved plant (Photo 6B). When trees and shrubs die, they are often "colonized" by lichens, which simply use the dead plant as a surface to grow and be

Photo 7: Lichens are "unlikenly" to colonize the bark of rapidly growing trees or those trees that possess sloughing bark, such as this silver maple.

Photo 8: Lichens are not moss. The natural world is much more diverse with living entities and enjoined, interactive ecosystems than most of us can imagine. A rather attractive moss has inhabited this stone patio where turf grasses will not readily grow due to shade.

exposed to moderate sunlight. Conversely, lichens tend to be discouraged from growing on fast growing, healthy plants or trees, especially, for example, those with sloughing bark (Photo 7). The natural world is much more complex and diverse than most of us understand. Hence, it is not wise to assume everything is a lichen (Photos 8 & 9).

BASIC INSTINCT …UH, LICHEN CONTROL:

Similar to the thriller movie *Basic Instinct*, staring Sharon Stone and Michael Douglas, the basic instinct of most people is to want to destroy lichens. So, to answer the question posed in the introduction: no, lichens do not generally harm our trees and shrubs….or our roofs or rocks. Lichens are simply using the surfaces of these plants and inanimate objects to live out

Continued on page 12

The Plant Doctor's LANDSCAPE TIPS

SHE LICHENS ME; SHE LICHENS ME NOT

Continued from page 11

their lives in marital bliss; as with any marriage, it can get a little tense at times. Even so, after the ugly creatures on the trees and shrubs are identified as a lichen, the next question is, "How do we get rid of them?" The short and correct answer is that we do not need to eliminate them, because they are causing no harm. In fact, scientists often find that the presence of lichens in a particular environment indicates little pollution and other human interferences and contaminants. In other words, lichens are some of the first organisms to be affected by adverse "stuff" in our environment. Their presence often indicates a healthy environment. But what if we don't want those ugly creatures growing on our expensive new cedar shake roof or on the granite memorial to our favorite cat, Fluffy? Following are some tips:

Physical Removal: Lichens can be removed by physical means from many surfaces. Scrubbing or power washing are highly effective. Be careful of harsh, aggressive cleaning efforts around plants.

Cultural: Because slow growing trees and shrubs are often inhabited by lichens, their health has usually been compromised by other factors such as soil compaction, lawn mower and weed trimmer blight, pest attacks, root rot and other diseases, poor soil nutrition, etc. Before blaming a lichen, it would be prudent to accurately diagnose the plant's health issues and try to make corrections to improve plant health. Also, abundant moisture tends to favor lichen development; because many landscapes receive too much irrigation, cutting back on water may help. Also, bright sunlight may inhibit lichens; pruning to allow more light penetration of the landscape may discourage lichen growth.

Photo 9: Many of us might identify this blob on this large elm in the photo as a lichen when, in fact, it is the Black Oozing Blob from outer space.

Chemical: Obviously, broad spectrum biocides such as household bleach (sodium hypochlorite), alcohol, detergents, etc. may kill lichens. These can be used in some situations where we are not worried about damage to our beloved trees or other plants. Such uses may be on household siding, roofs, fences, decorative stone, etc.

Because lichens represent a composite, an alga and a fungus, and because we know that algae and most fungi are extremely sensitive to the element copper, an occasional spray of a copper fungicide (examples: copper hydroxide, copper sulfate, Mancozeb, etc.) will gradually eliminate the lichen. Don't expect a rapid disappearing act just because copper has been applied. Trees and shrubs may be sprayed with a copper fungicide in manner much like we might control a disease on the tree. A strand of copper wire at the peak of the roof will usually prevent lichens (and moss) from growing on roofs. Again, lichens are actually harmless if beneficial in many aspects, and their elimination is not necessarily advised. L

The author, MSU and MGIA do not endorse any particular products. If using pesticides, be sure to read and follow label directions.

Wholesale Growers of
Premium Nursery Stock

Delivery Service Available
Quality Plants ▪ Quality Service ▪ Quality People

Kluck
NURSERY, INC.
1020 Van Wormer Rd ▪ Saginaw MI 48609
Phone 989-781-1650 ▪ Fax 989-781-0177

Visit us at
www.klucknursery.com

Development of Landscape Tips was sponsored by MSU & MGIA.

MGIA MICHIGAN GREEN INDUSTRY ASSOCIATION | MICHIGAN STATE UNIVERSITY EXTENSION