

**More News on Sudden Oak Death**

Last month's Roundup featured an overview on the progress made by University of California scientists (and others) in understanding and controlling *Phytophthora ramorum*, a newly-discovered pathogen affecting many oak trees in and around Big Sur. As a scientist living in Big Sur and also studying Sudden Oak Death (SOD), I can appreciate the efforts required to accumulate so much knowledge about this disease. For my part in the science of SOD, I would like to provide folks with a larger perspective on oak decline and to share with you some good news on the progress of halting the death of trees here in Big Sur.

Needless-to-say, we are all painfully aware of the health problems in our trees. Many of you, however, may not be aware that a significant number of the sick and dying trees are not suffering from *Phytophthora ramorum*. Pines are seen dying from pitch pine canker, sycamores are stricken with anthracnose, bay trees are toppling, fruit trees are no longer producing - in all there are dozens of diseases and insect pests affecting nearly every kind of tree in Big Sur. While *Phytophthora ramorum* stands out as a particularly aggressive disease, a wider view of the forest suggests that there is a more fundamental problem affecting the health of trees, and it likely has to do with the nutrient status of the soils.

Having studied the problem of tree die-off for over 20 years it is clear to me that Big Sur is experiencing "novel forest decline". Since the mid 20<sup>th</sup> century, region after region of the world has seen a massive die-off of mature trees (aka novel forest decline). While diseases and pests often appear in these dying forests, their role in the decline is secondary. Novel forest decline occurs most often in moist, aging forests, especially those experiencing acid rain and/or with acidic soils. Leading researchers in the US, Canada, and Europe are in agreement that the decline is tied to nutrient imbalances in aging soils with elevated acidity. Calcium deficiency and aluminum toxicity, both resulting from soil acidification, are seen as major agents in novel forest decline. (Literature citations are available upon request.)

Aging and acidification are unavoidable challenges for water-based life. Without regular infusions of alkaline-rich minerals, organisms (trees and humans alike) become more acidic and are more prone to sickness and disease. In forest ecosystems, this infusion of minerals occurs during disturbance events such as fires and floods which deposit mineral-rich compounds (e.g. ash and silt) onto the forest floor. Alkaline minerals, especially calcium, are major components of bark tissue, the tree's first line of defense against pests and diseases.

Now, consider these recent scientific findings: 1) there is published evidence linking SOD with acidic conditions and low calcium levels in the soil, 2) there are published data revealing a close connection between split bark tissue and SOD infection, 3) there are published studies showing that the incidence of SOD is "extremely rare" in forests that have burned within the past 50 years, and 4) there is published work describing how California tribes systematically used fire to promote health and productivity of oak woodlands.

Putting it all together the picture that emerges in Big Sur is one whereby shifting management practices brought on by white settlement of the region, along with the strict fire protection measures of recent decades, has allowed time for acidic conditions to develop in

the aging forests, resulting in elevated rates of mineral loss due to leaching. Trees growing in mineral deficient soils become ill and more prone to diseases such as SOD.

Whether or not the above picture is accurate, there is no denying that sick trees may be aided by providing them with proper nutrients. The good news is that where we have applied the proper (alkaline-rich) minerals to sick and diseased oaks, tanoaks, pines, buckeyes, madrones, sycamores, and redwoods here in Big Sur (and elsewhere), the large majority of trees have gotten better. I have accumulated hundreds of before and after photos that document this improvement. Talk to the folks in charge of tree care at Post Ranch Inn, Rancho Rico, Loma Vista, and Hearst Castle about the response of their trees to these mineral applications. Furthermore, there are no chemicals involved - the minerals being used are derived from natural sources, are OMRI approved, and are even recommended by the tree care industry as a way to combat SOD (*Tree Care Industry Magazine*, Dec. 2005; see also [www.azomite.com](http://www.azomite.com) & [www.arboright.com](http://www.arboright.com)).

To learn more about the minerals and how to apply them yourself, there will be two free community tree care workshops. One will be held in Marin County at the San Geronimo Cultural Center on Sat., Sept 23 from 2 to 5 pm; and the second will be held in Big Sur at Rancho Rico on Sat., Sept. 30 from 2 to 5 pm. For workshop sign-up, literature, questions, etc. please contact me, Dr. Lee Klinger, PO Box 664, Big Sur, CA 93920, 831-917-7070, [lee@suddenoaklife.org](mailto:lee@suddenoaklife.org).