

BOOK REVIEW

Fungal Strategies of Wood Decay in Trees. 2000. By F.W.M.R. Schwarze, J. Engels, and C. Mattheck; translated by William Linnard, published by Springer-Verlag, Berlin, Heidelberg, and New York. ISBN 3-540-67205-2.

The modern science of tree care was born in Germany in 1878 with publication of Robert Hartig's text on tree disease. Lacking the tools necessary for a closer analysis but building on Schacht's work of 1863, Hartig postulated that enzymes secreted by fungus caused cells to collapse, leading to the failure of trees.

The science of tree care took a leap forward in 2000, again in Germany, with the publication of *Fungal Strategies of Wood Decay in Trees*. Building on the work of Hartig, Shigo, and many others, this book shows the reader an entirely new way of looking at decay in trees. By understanding fungus–tree interactions more completely, we can make better decisions about how to handle infected trees.

Many authorities tell us infections by *Armillaria*, *Ganoderma*, *Inonotus*, and other fungi necessitate removal of the tree. After 10 years of research, Schwarze tells us "... the mere occurrence of a fungus fruit body on a tree does not indicate the extent of the decay;... decays often affect only a small amount of wood in the tree, so that stability and safety are not impaired."

The book begins with a review of wood anatomy, focusing on the layered structure of the cell wall. Cells are arranged into fibers, and the "body language" is expressed in reaction to mechanical stresses and pathogens.

Fungal pathology is reviewed next with advanced information on soft rots.

Chapter 3, the heart of the book, is devoted to fungus–host combinations. The illustrations help illuminate the concept of fungal pathology. First, electron micrographs take the eye into intracellular space, where the chemical battles take place. Three-dimensional drawings paint a clear picture of the disease and the defense. Shigo-style photographs show what we see in real life. As the authors state, "It requires an effort to understand these ... 'trials of strength'; ... the only sensible approach to predicting the future expansion of a decay ..." They also describe "many trees, old and young, in which a decay has been successfully compartmentalized."

Chapter 4 microscopically verifies the compartmentalization theory. Xylem rays are seen as decay's path of least resistance. Similarly, xylem cracks after large branch removal are "motorways" for infection, so "the use of wound sealants could be quite successful; ... there is still a great need for research here." The authors suggest that when large branches are removed, experimenting with sealants is preferable to opening the heartwood to decay.

A tree's vitality and reserves are key factors in a prognosis, so as always our first task is to make trees stronger. By knowing more about fungal strategies, the arborist can make a better diagnosis and can more confidently manage a tree.

(Reviewed by Guy Meilleur, Consulting Arborist, Apex, North Carolina.)