

Volume 35: Number 2 > 2019

The Quarterly Journal of the Florida Native Plant Society



# Palmetto



FNPS and State Parks • The Nature of Plants • False Rosemaries • Building Chapter Success



# Palmetto

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*To provide funds that will enable us to protect Florida's native plant heritage, please join or renew at the highest level you can afford.*

### To become a member:

Contact your local chapter, call, write, or e-mail FNPS, or join online at [www.fnps.org/join](http://www.fnps.org/join)

### The purpose of the Florida Native Plant Society

is to conserve, preserve, and restore the native plants and native plant communities of Florida.

### Official definition of native plant:

For most purposes, the phrase Florida native plant refers to those species occurring within the state boundaries prior to European contact, according to the best available scientific and historical documentation. More specifically, it includes those species understood as indigenous, occurring in natural associations in habitats that existed prior to significant human impacts and alterations of the landscape.

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## Features

### 4 State Parks Benefit From Native Plant Expertise

The Florida Native Plant Society is a valuable partner in preserving natural state park landscapes, and last year, FNPS volunteers served on 100 percent of state land management review panels. *Article by Eric Draper.*

### 6 Books of Note: *The Nature of Plants*

Craig Huegel's new book brings to light the complex ways plants live and interact with their environment. Not only does the book discuss topics like growth and reproduction, it includes real-life examples from Craig's own gardening experiences to increase understanding of what plants need to thrive. *Review by Ginny Stibolt.*

### 8 The False Rosemaries of Florida

In the southeastern United States, the genus *Conradina* is comprised of 7 species, each occupying a distinct geographic range, and 5 of these species are endemic to Florida. *Conradina* species are photogenic, attractive to pollinators and sun-loving, however, all but one species are listed as endangered. *Article by Todd Angel, Hanna Rosner Katz and Michael Jenkins.*

### 14 Building Chapter Success

Challenged to survive a change of venue and answer the call to increase membership, the Martin County Chapter grew by 65% through enhanced communications, vigorous outreach, strong mission-focused programs, and the friendliest meetings in town. *Article by Linda Eastman.*

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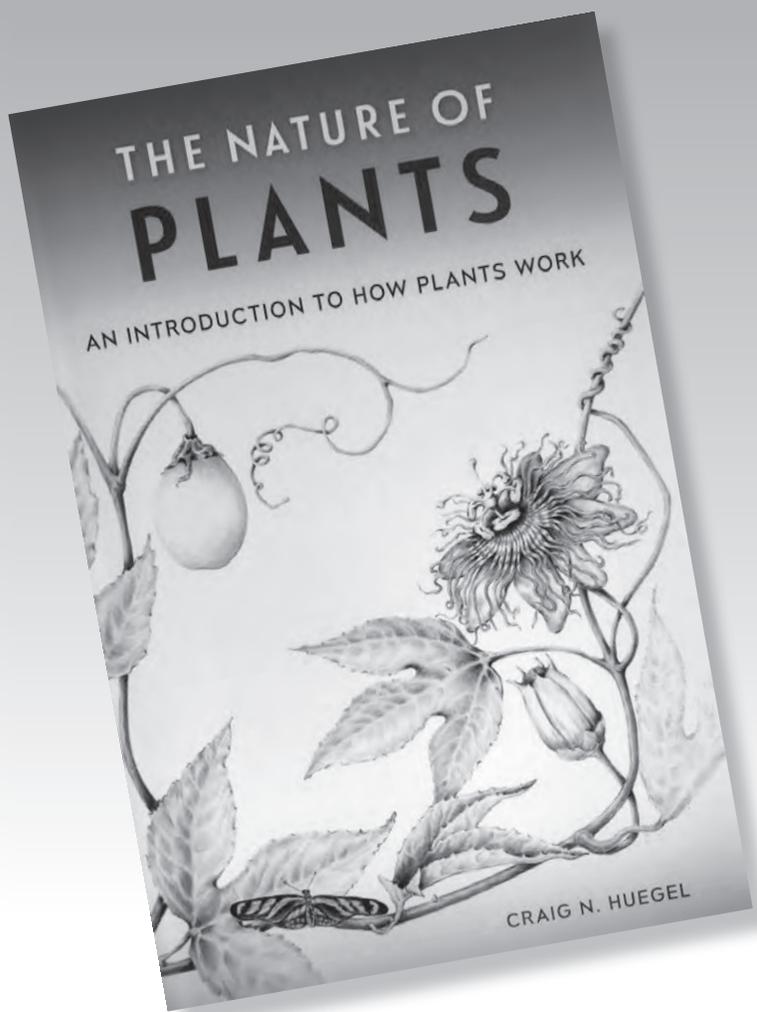
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### Editorial Content

We welcome articles on native plant species and related conservation topics, as well as high-quality botanical illustrations and photographs. Contact the editor for guidelines, deadlines and other information.

**ON THE COVER:** *Conradina brevifolia* (short-leaved false rosemary) is endemic to the white sand scrub habitat of the mid- to lower Lake Wales Ridge in Polk, Highlands, and Osceola Counties. Photo by Mike Jenkins, Florida Forest Service.



## BOOKS of NOTE

### *The Nature of Plants: An Introduction to How Plants Work*

Craig Huegel

288 pages

Published by University Press of Florida, 2019

ISBN 13: 9780813064086

There are eleven chapters, an introduction, and a very short conclusion. I might have expected a glossary, but that's not included. As Huegel explains in the introduction, this is not a botanical textbook and makes a recommendation for one, if that's what you want. Most terms are well explained within the text and there is an index if you want to refer back to a term that has been previously explained.

#### **Light, Water and Soil**

In the first three chapters, *Light*, *Water*, and *Soil*, Huegel describes the basic botanical concepts. He begins with light and the chemistry and process of photosynthesis, plant circadian rhythms, and how best to position plants to receive optimal sunlight. Some of this goes back to his work for his book *Native Florida Plants for Shady Landscapes* where he describes the variations in shade. He explains how plants need uninterrupted darkness so they know when to bloom and put out new leaves. Artificial landscaping lights can disrupt this finely-tuned system.

In the *Water* chapter, Huegel points out how plants can extract the water they need to stay turgid, for photosynthesis, and other uses even though more than 90% of the water moves straight through the plants and evaporates into the air (transpiration). He also discusses why too much or too little water can damage the plant, and why sometimes no matter how much moisture is in the soil, plants may wilt during a hot afternoon.

The *Soil* chapter explains the macro- and micro-nutrients plants need and the critical roles bacteria, fungi, and insects play to help make those nutrients more available to plants. Typical urban landscape practices like having too much lawn and removing all of the dead plant matter

#### **Review by Ginny Stibolt**

Even though I earned my MS in Botany long ago, I have delved deeply into various aspects of the field in the past dozen years as I've researched my five gardening/landscaping books and other projects to update my knowledge. So when I agreed to review this book, I did not expect to learn a whole lot. I was correct to some extent: I was familiar with much of what Craig Huegel presents, but he has made what could be dry and impersonal science into his personal tour of each topic as a grower and gardener. In this manner, he has not just imparted the basic information to the reader, but has provided reasons why each aspect of how plants work is important to a gardener or is just fun to know.

There are color illustrations and photographs throughout the book that help to explain the science. Huegel includes real-life examples (both positive and negative) from his own experiences in his garden and as a nurseryman. This method of storytelling makes it easy for even the most novice gardener to gain an understanding of plants and gardens. On the other hand, there is plenty of information that will allow even experienced botanists to learn new details that will be useful in their landscapes.

are the exact opposite of what should be done to maintain healthy soil that will benefit plants.

### **Structure and Growth, Roots, Stems and Leaves**

The next four chapters on plant structure focus in detail on major plant vegetative organs. They are: *Basic Plant Structure and Growth, Roots, Stems, and Leaves*. Here, Huegel covers the basics of various cell types, organelles within the cells, and tissue types, including wood. If you've been working in botanical studies, these chapters are the least surprising, but there are wonderful moments, such as why palms, which have no real wood, last longer as logs than true trees when used as building material. You'll also learn how the very specialized leaves of carnivorous plants function, and why some plants go to all this work to supplement their diet. He explains that most plant carnivory occurs in plants that live in highly acidic soils where nutrients are unavailable. Sometimes insects are digested by the plant, but other plants trap the critters, attracting predators that eat the trapped insects. The predators then deposit their feces, which the plant can use more readily.

### **Reproduction and Seeds**

Chapters 8 and 9 are titled *Reproduction* and *Seeds*. Huegel covers flowering, flower structure, pollination, fruit development, and seed germination. These details of how plants reproduce, sexually and/or asexually, are important for gardeners so they can help plan for the next generation of plants. Knowing which plants need pollinators helps the gardener place plants in the landscape to invite pollinators to the party. Huegel describes how fruit evolved to tempt the appetites of various animals – but not until the fruit is ripe and seeds can withstand a trip through the animal's digestive tract. Animals carry seeds far from the parent plant, and the seeds are deposited with a dollop of rich organic matter, giving them a head start in their new environment. The *Seeds* chapter not only covers the various structures of seeds, but it also provides some good information on how seeds require different conditions to germinate, such as exposure to light, fire, or stratification. Some even require a prolonged period of cold, which we can emulate in our refrigerators.

### **Plant Hormones and Plant Communication**

But probably the most interesting chapters for more experienced gardeners and landscapers are the last two: *Plant Hormones* and *Plant Communication* – where Huegel delves into the mysterious world of plant communication, exploring the messages and warnings conveyed to animals or other plants through chemical scents and hormones.

### **The Peer Review Process**

*The Nature of Plants* was published by the University Press of Florida (UPF), which means that it was “peer-reviewed.” Over the years people have asked me about this, so here's an explanation of how it works. The Press engages at least two experts with differing fields of expertise to carefully read the manuscript for accuracy, to make suggestions for improvement, to analyze the marketability of the book, and more. In general, the peer-review process adds six months to a year or more to the publishing cycle, and in some cases, the reviewers may nix the whole idea of the book. I've been on both ends of this interesting process – serving as the author and as the reviewer.

As an example, for my first book, *Sustainable Gardening for Florida*, the three peer reviewers corrected a bunch of errors and also said the order of the topics needed to be reversed because I'd begun with the most difficult topics when I should have started with the easiest. The new order of topics meant that I had to rewrite the whole book, which added a more than a year to the process, because after I'd rewritten it, two of the reviewers read it again. People have asked me if the rewriting and delay made me angry. My answer is that while it was certainly frustrating in the short term, the end result of the review and rewriting process was a much better book. My other three UPF books have also been enhanced by suggestions and input from peer reviewers.

For Huegel's book, there were three reviewers: Gil Nelson, botanist, author, and professor emeritus at Florida State University; Erin Goergen, ecologist, conservation biologist, and professor at St. Petersburg College; and Nicole Pinson, educator, urban horticulture agent, and Master Gardener Coordinator for Hillsborough County.

What you may notice about these reviewers is that their experience and fields of expertise vary. This helps to produce a book suitable for a wide audience. If all the reviewers were university botany professors, then the book might be attuned to what professors want to see, but maybe not what a gardener or homeowner would find most useful.

These two chapters help the reader realize that while plants don't have brains as we know them, they have evolved in surprising ways to get things done. Some of these we're just finding out with the latest rounds of current research.

For the chapter on plant hormones, Huegel covers the various types of hormones and goes far beyond just the auxins present in the apical bud that cause two or more side buds to sprout and vie to take over as the plant's new main leader. In addition to auxins, the major hormones discussed include gibberellins, cytokinins, ethylene, and abscisic acid. He also introduces the more minor hormones, pointing out that “...much of the cutting edge work on plant

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## BOOKS of NOTE

### *The Nature of Plants: An Introduction to How Plants Work*

*Continued from page 7*

hormones is based on other hormones discovered in the past few decades and for which a developing body of information is now emerging.” It turns out that plants are just as complex as animals when it comes to hormonal activity.

Plants use hormones as a means of defense, and Huegel includes fascinating information on how this works and what compounds are involved in the process. He writes: “Because plants cannot avoid danger by moving away, they must form defenses against pathogens, competitors, and herbivores while standing their ground.” Huegel closes the chapter with a discussion of the roles plant hormones play as growth regulators, in coping with stressful situations such as drought, salt, or nutrient deficiencies, and in flowering, where the primary hormone involved, florigen, was not pinpointed until 2005.

In the chapter on plant communication, Huegel discusses both above- and below-ground communication methods. Above ground, plants may release volatile organic chemicals (VOCs) to warn other plants about danger and/or to attract predators to the presence of herbivores attacking the plant. Plants can even tell the difference between damage from hedge clippers and that of herbivores and respond accordingly. Below-ground communication methods involve special fungi, mostly mycorrhizae, as the message bearers to other plants’ rhizospheres. This is fascinating stuff to know and drives home the case that we should “stop treating our soil like dirt.”

Huegel concludes his book with this thought: “Perhaps your understanding of plants and how they work has been changed a bit. If we have done that together, we will have accomplished something significant both for ourselves and this amazing world we share with the rest of creation. Tend your plants and garden with reverence.”

As a botanist, I think this is an important book to add to your collection, because the more you know, the better your landscape grows. You can order it online at the University Press of Florida website: [www.upf.com](http://www.upf.com)

#### **About the Author**

Ginny Stibolt is a botanist, garden writer, and FNPS member. Her blog is [www.GreenGardeningMatters.com](http://www.GreenGardeningMatters.com).