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Solve the Worst 5 Palm Problems

Identify and treat problems in palms before they become serious because the cost of producing and installing large specimen palms can be high

By TIMOTHY K. BROCHAT, Ph.D.

Palms are an important component of the landscape in areas having mild climates. They impart a distinctly tropical look that few other plants can provide. Unfortunately, because most palms have only a single terminal bud or growing point, diseases or physiological disorders that might merely weaken broadleaf trees are often fatal in palms.

1) **Fusarium Wilt**

One of the most serious diseases of Canary Island date palms in California, and more recently Florida, is Fusarium wilt. It is characterized by death of the leaflets on one side of an older leaf or the leaves on just one side of the crown. Symptoms typically begin on leaflets near the base

of the leaf, progressing along one side of the leaf to its tip and back down the other side to its base. Once the majority of leaves in the canopy have died, the remaining green leaves will wilt and the bud will die. Unfortunately, there are no effective chemical controls for this disease and reducing the rate of spread to healthy palms is the best strategy.

Fusarium oxysporum f. sp. *canariensis* can survive for years in the soil and can readily infect new replacement palms. Similarly, transplanted field-grown palms from infested fields can spread this disease. However, the primary means of spread is via contaminated pruning tools.

Infected palms should only be trimmed once per year to minimize spread, and all tools used should be disinfected before moving on to the



► 1) Fusarium wilt of Canary Island date palm.

next palm. Research at the University of Florida has shown that soaking tools for 10 minutes in 25% chlorine bleach, 50% isopropyl or denatured alcohol, or 25% Pine-Sol disinfectant are all effective in eliminating this fungus from pruning equipment. When pruning, avoid cutting into green leaf bases.

2) Lethal Yellowing

Lethal yellowing (LY) is one of the most serious diseases of palms in Florida, but it also occurs in the Brownsville, Texas area, and parts of Mexico, Central America and the Caribbean. This microbe is spread only by phloem-feeding insects such as the leafhopper, *Myndus crudus*. Approximately 30 species of palms are susceptible to LY.

Symptoms of LY in most coconut palms may begin with mid-canopy or older yellow leaves that drop down against the trunk, but in some species such as Christmas palm these collapsing older leaves may not show any yellowing. In Malayan Dwarf coconut palms, leaves appear wilted, with little or no yellowing evident. Blackening of the flowers and premature fruit drop are also characteristic symptoms of LY in coconut palms.

Lethal yellowing is best prevented by planting palms resistant to the disease, but it can be prevented in susceptible species by trunk injection with oxytetracycline. If the disease is diagnosed at a very early stage, antibiotic injection results in recovery for about half of the treated palms. Common palms known to be resistant to LY include paurotis palm (*Acoelorrhaphes wrightii*), pindo palm (*Butia capitata*), European fan palm (*Chamaerops humilis*), areca palm (*Dypsis lutescens*), thatch palms (*Coccothrinax* and *Thrinax* spp.), royal palms

(*Roystonea* spp.), sabal palms (*Sabal* spp.), queen palm (*Syagrus romanzoffiana*), and Washington palms (*Washingtonia* spp.).

3) Ganoderma Butt Rot

Ganoderma butt rot is probably the most devastating palm disease in the southeastern United States. Its range corresponds roughly with that of the sabal palm (*Sabal palmetto*) and extends from South Carolina to Florida. Although this disease has only been documented on about 40 or 50 species, it is believed that all palm species are probably susceptible.



◀ 2) Lethal yellowing of coconut palm.

▼ 3) Ganoderma butt rot on sabal palm.



Ganoderma butt rot is primarily a disease of mature palms in the landscape. Symptoms appear as wilting and death of the oldest leaves, but it gradually progresses up through the canopy until the bud is killed. Unfortunately, there is no chemical control for this fungus and fumigation of Ganoderma-infected stumps or root systems is not effective in eliminating this fungus.

One of the earliest and most diagnostic symptoms for this disease is the presence of the fungal fruiting structure (conk) on the lower portion of the trunk. These conks start out as small white lumps but quickly mature into brown woody brackets up to 1 foot across, releasing millions of

spores capable of infecting dead palm wood or healthy palms some distance from the point of release. Although mechanical wounding of palm trunks increases the likelihood of infection, wounding is not necessary for infection to occur.

Ganoderma zonatum, the causal organism, can also spread through the soil, living on dead palm roots and wood. One of the most common means by which Ganoderma infects clumping palms is when mature canes of these palms are removed. The resulting dead stump is quickly invaded by Ganoderma spores. Once established on the stump, this disease invades and kills healthy living canes until the palm is killed.

Any palm tissue infected with *Ganoderma* should be hauled to a landfill or incinerated, but never chipped for mulch, as this has been shown to transmit the disease

to healthy palms. Stumps remaining after palm removal should be dug out. Also, any new conks should be promptly and regularly removed to prevent the production of additional spores.

4) Potassium Deficiency

Potassium deficiency is probably the most widespread and serious nutrient deficiency of palms throughout the world. Palms have rather high requirements for potassium and since they often grow in highly leached, sandy or nutrient-poor soils, this element is deficient to some degree in virtually all palms in the landscape.

Deficiency symptoms vary among palm species, but usually begin with small

translucent yellow to orange or necrotic spotting on the oldest leaves, readily visible if the leaf is held up to the light. As symptoms progress, these older leaves may take on a yellow-orange to bronze color that is visible from some distance. One of the key symptoms on most species is the presence of necrosis along the margins of the leaflets of older leaves. As this becomes more severe, entire leaflet tips become withered or frizzled in appearance, yet upon close examination, the midrib of the leaf will remain alive, though perhaps discolored. The gray frizzled old leaves typically found on royal palms (*Roystonea* spp.) and the golden-orange foliage of areca palms (*Dypsis lutescens*) are common examples of potassium deficiency.

Potassium is considered a "mobile" element within plants. Under conditions of deficiency, potassium will be removed from older leaves and retranslocated up to

results in potassium being removed from progressively younger leaves that were previously symptom-free. If this practice continues, the palm will quickly run out of old leaves from which to remove potassium for new growth and the palm then enters a state of rapid decline. At this point, the trunk diameter tapers to a point, all new leaves emerge stunted, chlorotic and frizzled and death of the bud soon follows. This late stage of deficiency is extremely similar in appearance to manganese deficiency and only close examination of the symptoms of an individual leaf will reveal which problem is present.

In addition to poor soils, one of the primary causes of potassium deficiency in palms is the use of fertilizers having high nitrogen content in controlled release form, but low to moderate levels of potassium in soluble form. This combination forces rapid palm growth, yet provides insufficient potassium to

do so. Thus, the use of turf fertilizers in the vicinity of palm roots is a major cause of deficiency in palms.

Treat severe deficiency by broadcasting sulfur-coated potassium sulfate under the canopy at a rate of 1.5 lbs. per 100 sq. ft. every three months for a year or more. To prevent a

K-Mg imbalance from occurring under these circumstances, it is also necessary to apply a 100% coated palm maintenance fertilizer at the same rate and frequency starting six weeks after the first potassium fertilizer application. (Mild to moderate potassium deficiency can usually be corrected by using only the maintenance fertilizer.) A good palm maintenance fertilizer should have an N-P-K-Mg ratio of about 2-1-3-1 and also contain essential micronutrients such as Mn, Fe, Cu, B and Zn. In order to prevent rapid leaching loss, all N, K and Mg should be in controlled release form.

Injecting Palms Made Easy

For many years, arborists have faced numerous palm tree problems: nutritional deficiencies, borers and lethal palm yellows, to name a few. Recently, many professionals have turned to chemotheraputant treatments. Many in the industry are using one of the many microinjection technologies that are available.

One problem in treatment exists, however, and this stems from the difference between the anatomy of palms and all other trees. Palm trees are monocotyledons. This fact makes them more closely related to grasses than to other types of trees.

The configuration of the vascular tissue is unlike that of any other type of tree. Instead of a ring of conductive tissue under the bark, the vascular tissues of palms are made up of tight groups of conductive cells known as bundles. These bundles contain both xylem and phloem tissue and are connected radially to other bundles by live and woody, non-cambial structures. Because of this vascular tissue orientation, palm trees translocate fairly evenly throughout their entire cross-section at any given point up or down the trunk.

When you need to microinject a palm, you must take into account:

- height of the palm tree when calculating the dose of the chemotheraputant;
- diameter of the microinjection holes to be as small as possible;
- microinjection feeder tube to be long enough to allow the material to penetrate the spongy outer husk of the palm tree;
- injection holes of palms to be made to a depth of up to 1/3 the diameter of the palm tree;
- injection sites to be made no lower on the trunk than 2 feet above the ground;
- spacing of injection holes to be made as far apart as possible;

cont. on page 76



▲ 4) Moderately severe potassium deficiency on areca palm showing frizzling of leaflet tips.

newly expanding leaves where it will be incorporated. Thus, potassium deficiency symptoms are always most severe on the oldest leaves and decrease in severity in younger leaves. On a single older leaf, deficiency symptoms are most severe at the tip, but may be minimal near the base.

Since the palm removes potassium from older leaves in order to continue new growth, premature removal of discolored, symptomatic older leaves by landscapers

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cont. from page 74

• spacing to also include offsetting of the vertical alignment, resulting in a spiral type placement of the injection sites.

Unlike other trees, palm injection holes remain active for up to one year, allowing for multiple injections using the same hole. Palm injection holes do compartmentalize, but the holes do not callus over and it is possible to use an existing inactive site by drilling the hole deeper. However, the total depth of the hole should not exceed more than 1/3 the diameter of the trunk.

Remember: Because of the anatomical differences between palms and other trees, understand that what is good for other trees may be quite bad for palms.

Marty Shaw is a Certified Arborist, a Certified Nursery Professional and President of TIPCO, Inc. in Knoxville, TN. His email address is treeguru@treedoc.com and the website is www.treedoc.com.

5) Manganese Deficiency

Unlike potassium, Manganese is "immobile" within a palm, so deficiency symptoms occur on the youngest leaves. New leaves emerge chlorotic, with longitudinal necrotic streaks on the leaflets. As the deficiency progresses, most of the leaflets appear withered or frizzled and the entire leaf is greatly reduced in size. Leaflet frizzling symptoms are more severe at the base of the leaf than at the tip, the reverse of potassium deficiency patterns. If not promptly treated, the next leaf may emerge as only a necrotic petiole stub with death of the bud quickly following. Old leaves of Manganese-deficient palms will usually remain full-sized and green.

Manganese deficiency is usually caused by high soil pH, since manganese solubility decreases sharply with increasing pH. It can be treated by soil applications of manganese sulfate (TechMangam) every three months or so. Foliar sprays with the same product



▲ 5) Manganese deficiency of queen palm.

will also give good short-term results, but will require frequent re-applications if soil applications have not been made.

Timothy K. Broschat is Professor of Tropical Ornamental Horticulture at the University of Florida at Ft. Lauderdale.

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Events

FEBRUARY

20-24 Western Canada Turfgrass Association Annual Conference & Show Penticton Trade and Convention Centre, Penticton, BC, Canada; 604/467-2564; fax 604/467-0500

20-24 ALCA Executive Forum Weston Mission Hills, Rancho Mirage, CA; 800/395-2522; www.alca.org

22 NYSTA Southeast Regional Conference Holiday Inn, Suffern, NY; 800/873-8873; fax 518/783-1258

23-25 Athletic Field Construction & Maintenance Rutgers' Cook College Office of Continuing Professional Education, NY; 732/932-9271; www.aesop.rutgers.edu-ocpe

23-25 Western Pennsylvania Turf Conference & Trade Show Pittsburgh Expo Mart; Monroeville, PA; 814/863-3475; www.psu.edu

24-27 OPEDA Annual Meeting Caesar's Palace, Las Vegas, NV; Julie Thane, 215/564-3484; 215/564-2175; www.opeda.org

25 OSU Extension University Turf School Tom's Country Place, Avon, OH; Charles Behnke, 440/322-0127

26 Ecology & the Managed Landscape Boxborough, MA; Cheryl Lowe, 508/877-7630 x3401

MARCH

2-4 New England Regional Turfgrass Conference Rhode Island Convention Center, Providence, RI; 401/848-0004; www.nertf.org

4-7 Association of Professional Landscape Designers Winter Conference Ramada Plaza Hotel, San Francisco, CA; Jack Lagershausen, 312/201-0101; www.apld.com

9-12 ASCA Arboricultural Consulting Academy Rhode Island Hotel Viking, RI; ASCA 301/947-0483

11-12 Cemetery Grounds Maintenance for the Millennium Melville Marriott, Long Island, NY; Maria Cinque at 516/842-1009

18-21 ALCA Student Career Days University of Kentucky, Lexington, KY; Elise Lindsey, 703/736-9666

20-25 American Society of Golf Course Architects Annual Meeting Charleston, SC; Chad Ritterbush, 312/372-7097; www.golfdesign.org

22 Plant Health Care Seminar University of California Extension-Riverside; Jan Crump 909/787-5804, ext.1621; 909/787-2456; www.unex.ucr/ns/ns.html

23 Basic Turf Management Seminar University of California Extension-Riverside; Jan Crump 909/787-5804, ext.1621; 909/787-2456; www.unex.ucr/ns/ns.html LM

www.bluebirdintl.com (2/99). At the bottom, there is the BlueBird logo, which consists of a stylized blue bird icon and the text 'BLUEBIRD™ EASYSCAPE'. Below the logo, it says 'Circle 125' and '© 1999 BlueBird International, Inc.'"/>

SUPPLIERS CORNER

Karl Kisner has joined **Agrevo** as product manager for the Green Industry Group. Kisner will focus on promoting the company's new DeltaGard® brand of insecticides (pyrethroids) as well as its full line of products for the Green Industry.

Barenbrug USA has appointed Bryan Muntz as turf salesman, responsible for sales of Barenbrug's professional turf products in the US market.

Becker-Underwood has acquired full ownership and control of Sprint and Sequestrene product lines from Novartis. Both brands use iron chelate products to correct soil and foliar iron deficiencies. Sprint is sold in the turf and ornamental markets, Sequestrene in citrus, agricultural and other specialty markets.

Century Rain Aid has purchased the turf irrigation division of Koonz Sprinkler Supply,

a major New England distributor. This new acquisition will allow Century Rain Aid to provide service and supplies to irrigation professionals throughout the southeast coastal areas of New Jersey and Monmouth County, PA.

Dow AgroSciences has named Keith Roach as communications manager of Turf, Ornamental and Technical Products and Bruce Miehle as general manager. Tony Brown is the marketing manager for turf, ornamental and retail products.

EPCO Products, producer of the Zero-Leak Gold Plugs and Fittings, has appointed Roger Metz as sales manager of the Zero-Leak line.
www.epcoproducts.com

Growth Products, "The Liquid Solutions Company," has a new website that has helpful tips, detailed product information and university studies of

their products.
www.growthproducts.com

Horizon and Automatic Rain have announced the merger of the two companies, effective Jan. 1, 1999. The company will be headquartered in Phoenix, AZ, and will have locations in Arizona, Nevada, northern California, Oregon, Washington and Mexico.

HCC, Inc. has received ISO 9001 certification for design production and service from American Quality Assessors. HCC has spent the last two years establishing the ISO 9001 Quality System and plans to continue to improve quality.

MacKissic has appointed Newton Distributing Company to cover Kentucky and western Tennessee as a full-service distributor.

Milliken Chemical has entered into an agreement to acquire the existing products and

brands of Emerald Isle, Ltd. of Ann Arbor, Michigan, and into a long-term agreement to co-develop new products for the turf and ornamental market.

PBI/Gordon has been issued marketing rights to Velocity® Insecticide by Valent. The fire ant product will be marketed through PBI/Gordon's farm store brands.

Plant Health Care, Inc. has established the PHCTM Education Center in Beaufort, SC. The facility is dedicated to the practical understanding of the physical, chemical and biological requirements of plants in urban landscapes and other man-made environments. Four to six workshops will be held yearly.

Shindaiwa has named Carmelo Grenier as its new Western Regional Sales manager for the western states and Bertil Albing as the Technical Services Representative for the company.
www.shindaiwa.com

The **Textron Turf Care and Specialty Products** facility at Johnson Creek, WI, has received registration to ISO 9001, the quality assurance standards developed by the International Organization of Standardization. The design, manufacture and distribution of products, such as Bob-Cat and Bunton mowers, fall under the umbrella of ISO 9001 registration. The registration is part of an ongoing plan by Textron to align its entire organization with international quality standards for all its products. **LM**

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Team ^c	■	●	●	●	●	●	NR	NR
Ronstar ^d	●	■	NR	●	●	NR	NR	NR
Surflan ^e	■	■	■	●	▲	●	■	■

Level of control

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▲ Medium-High

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^aNovartis

^bRohm and Haas Co.

^cDow AgroSciences

^dRhône-Poulenc



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ANNOUNCING: The Third Annual LANDSCAPE MANAGEMENT "Emerald Awards." LANDSCAPE MANAGEMENT magazine is offering a \$500 first prize to the winner of a random drawing to be held on July 1, 1999. Second prize is \$300 and third prize is \$200 in cash. To be eligible for the drawing, simply fill out the questionnaire at right and return it to our editorial offices.

Answers to the questions will determine our "1999 Emerald Awards" winners, to be revealed—along with the contest winner—in our August issue.

CONTEST REQUIREMENTS: Contestants must be owners or employees of landscape maintenance companies, lawn care companies or landscape contracting firms; or an athletic field manager or member of an athletic field maintenance crew; or manager or member of a facility landscape management crew. Product selections must be currently used by entrant.

Employees of Advanstar Communications or their families not eligible.

All questions on this entry form must be completed, and all blanks filled. One entry per person. No more than five entries from any one employer will be allowed. Entry forms will appear in the February through June, 1999 issues of LANDSCAPE MANAGEMENT.

Completed questionnaires should be mailed to: Emerald Awards, LANDSCAPE MANAGEMENT, 7500 Old Oak Blvd., Cleveland, OH 44130. They must be received by noon, July 1, 1999.

A random drawing of all eligible entry forms will be held July 1, 1999. Winners will be notified within 24 hours.

1999 EMERALD AWARDS

OFFICIAL ENTRY FORM

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