Solve the 5 Worst 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. BROSCHAT, 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.

▶ 1) Fusarium wilt of Canary Island date palm.

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

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 (*Acoelorrhaphe 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.).

◀ 2) Lethal yellowing of coconut palm.

▼ 3) Ganoderma butt rot on sabal palm.

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.

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 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.

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

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

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• 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.

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

▲ 5) Manganese deficiency of queen palm.

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