

PlantHealthCare.com

OCTOBER/NOVEMBER 2000

ONLINE MAGAZINE

Monrovia Nursery's Worldwide Outlook on Regional Plants

Commentary:
**Pesticides Aren't
the Problem**

PHC-TV Presents
**"PHC Management
System"**

NEW!
**The Secret Life of
Plants in Winter**

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Monrovia Nursery's Worldwide Outlook on Regional Plants

By Bruce F. Shank, Editor

Monrovia Walks Fine Line Between Nature and Mankind's Intervention

Evolution cannot be simplified to circumstance. Environmental stress has caused mutations in genetic material for millions of years. Those adjustments in what could and could not live on this earth, in the face of cataclysmic changes in temperature, determined the biological makeup of our planet today. For us to expect that perfectly adapted plants are realistic for a multitude of microclimates in a matter of decades is simply unscientific.

It's not for lack of trying, as Dennis Connor, general manager of the Azusa, CA branch of Monrovia Nursery will attest. A tissue-culture lab on the 75-year-old nursery's 500-acre site in Los Angeles County is totally devoted to fooling Mother Nature. Two more 500-acre-plus sites in Visalia, CA and Dayton, OR help generate the volume of improved plants to meet demand.

Scientists have been able to fool cells into making human insulin and to make corn resistant to certain herbicides, but we have yet to tweak plant genes to counter every environmental stress in all regions of Planet Earth.

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Monrovia Nursery



Monrovia Nursery

Matching Plants to Markets CONTINUED

To question the earnestness of Monrovia's efforts to find the perfect plant for nearly every major market for plants in the United States and many foreign markets would be just plain shallow. "We have a large tissue culture lab at our Azusa facility," Connor says. "Tissue culture is an expensive proposition that many customers would not be willing to pay for in the cost of product at this time. It's not anywhere as simple as the news articles [on cloning sheep] would suggest. Using tissue culture to discover disease and insect resistance for hundreds of plants is a much bigger challenge than you might think from media coverage."

Shooting for High Probability of Success

"Many plants can often survive for five to ten years in their particular area without being seriously threatened by pests or weather," Connor adds. "But there is more than survival to consider. Performance is based upon many things, such as winter temperatures, rainfall and day length. Unless you grow a plant under controlled conditions, you can't predict the outcome. Neither can a nursery. So, we try to anticipate the conditions faced in all our markets so we can assure our customers will be impressed by the performance of our plants."

"There is no single cultivar that will fit all regions. We recognize that fact and plan accordingly. That is why this particular nursery has expanded since 1926 when Harry Rosedale decided that nurseries could extend their reach beyond agriculture. The independent retailer is our market, and we devote all our energy in that direction, although re-wholesalers, growers and landscapers comprise a large portion of our market also."

Less than ten miles from Connor's office is California Polytechnic State University in Pomona, one of the most prominent universities in horticulture in the U.S. The Rosedale family has played a major role in the emphasis placed on horticulture at the state institution. Connor graduated from Cal Poly in 1972 with a major in biology and a minor in botany. "I worked my way up in the propagation department and landed as General Manager because I understood our products," reflects Connor. "After 28 years here, I feel confident that we are doing all we can to provide regionally adapted cultivars of nearly 1,600 different varieties."

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Monrovia Nursery

Matching Plants to Markets CONTINUED

Connor speaks with authority, since the company holds more than 100 patents and 160 trademarks for plants. It has introduced more than 250 exclusive new plants. “I understand why some people might think large national nurseries try to cut corners where they can,” he says, “but I also know personally how much our seed and rootstock suppliers try to serve us. We have thousands of wholesale and retail customers to answer to. Our future is tied directly to plant performance, long-term.

“This remains a family-owned enterprise, one that has been a leader in the industry in environmental stewardship, customer service, and scientific research,” Connor says. “We have the ability to give research priority over a short-term stock value. As a corporation, we evaluate the cost of research and how much our customers are willing to pay for the benefits of it. We are very realistic about what our scientists forecast and what our customers are ready to absorb. As an example, we now incorporate mycorrhizal fungi into our soil to establish a symbiotic relationship between the plant and soil.”

The Real World

Connor points out that ornamentals are more than individual plants. “We produce millions of plants each year on rootstocks that are adapted to certain regions of the country,” he says. “We buy our seed from companies where particular plants grow best, in other words, where they are best adapted. To infer that we take a regionally limited plant, produce it only in nurseries where all seedlings thrive, and then ship it across the nation without concern for survival is totally unrealistic.”

At the same time, Connor admits the limitations, or at least the modest pace, of faster types of gene manipulation like tissue culture. “It’s very expensive and time consuming to select the exact package needed for hundreds of markets. This cost ends up in the price of the product. Like all other businesses, we are aware of supply and demand and their related costs. We have to compete in the marketplace too.

“Unfortunately, fungi and insects have much shorter generations than most plants,” Connor says. “The length of the generation determines the speed at which adaptation can take place. Tissue culture might be able to shortcut generational intervals, but you

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Matching Plants to Markets CONTINUED

are dealing with thousands of possibilities for each pest. Resistance to new control methods might happen before you fully implement a defense. There is the potential to throw a lot of money down the drain.”

Adaptation can backfire. Some plants that are attractive and well behaved in the U.S. West can be invasive in other states. Examples are the pepper tree and Japanese bloodgrass. “A certain degree of restraint is critical,” Connor says. “We have to anticipate quarantines before they happen from regional feedback. The problem with certain eucalyptus cultivars is a good example. Had the industry been more concerned about a safe mixture of cultivars, we probably wouldn’t have the problem we do now with the lerp psyllid. Adaptation can be a problem as well as a benefit.”

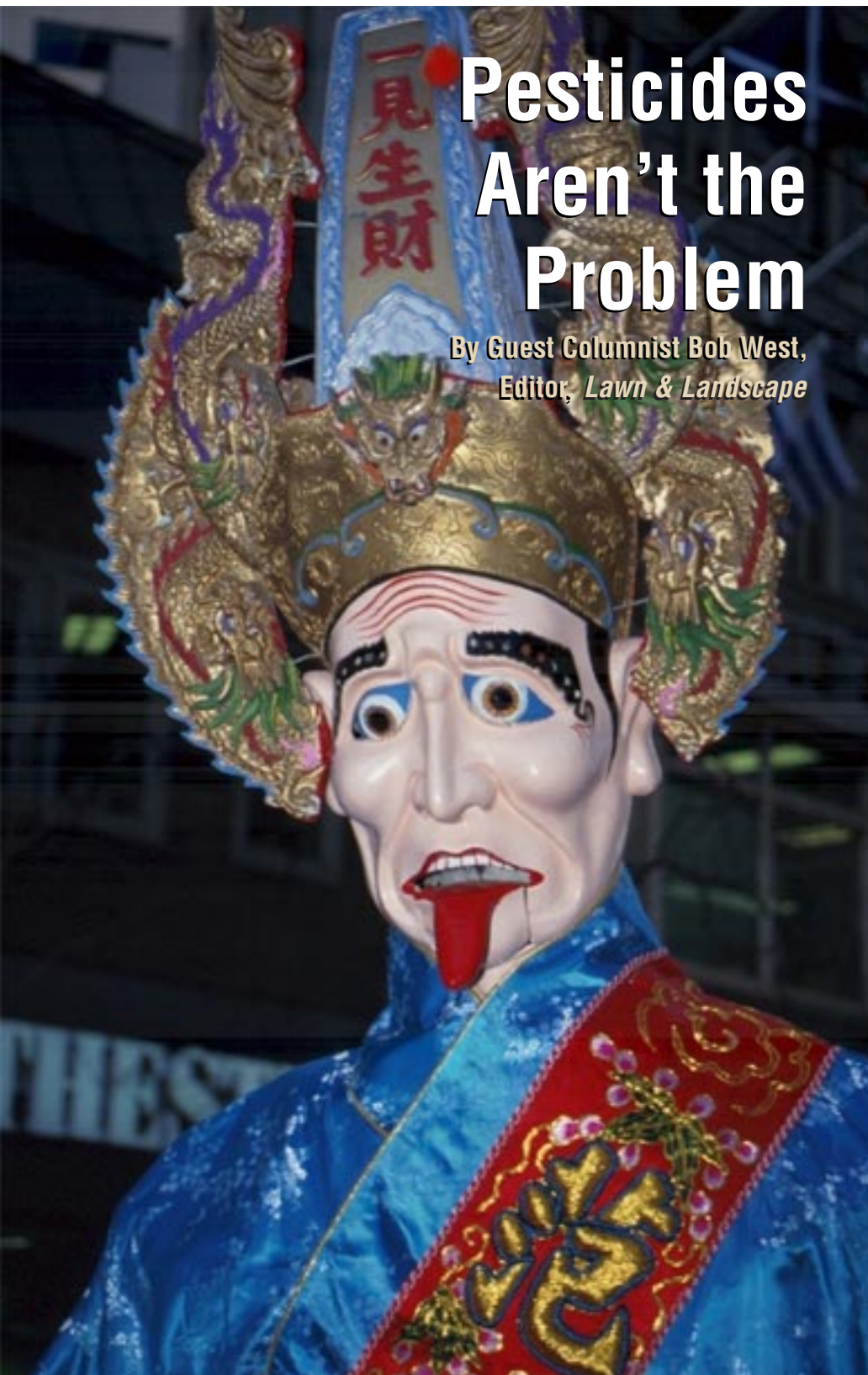
A compromise is in order. Natural selection can’t take place when man interrupts the process. Tissue culture takes natural selection out of the loop. It might result in a total collapse of a cultivar if we aren’t careful. Consequently, the wisdom of a veteran nursery can provide the middle ground needed to avoid unnecessary disasters. None of it can work without regional feedback. Therefore, the nursery with the best network of feedback will be the one to buy plants from in the future. Monrovia is grounded on the common sense of strong customer relations. The lowest price might buy you a very short future.



Agricultural Research Service

Pesticides Aren't the Problem

By Guest Columnist Bob West,
Editor, *Lawn & Landscape*



FACT: The same pesticide used in a leading turf insecticide is used on dog collars to control fleas.

FACT: Another common turf insecticide is used to cure head lice in children.

FACT: Another common product comes complete with a material safety data sheet that recommends wearing gloves and goggles when using the product — table salt.

We've all read or heard our fair share of fairy tales, so we're all fairly well acquainted with the infamous emperor who was made a laughingstock by the combination of his vanity, his tailor and a young boy. But the reality is that there was one more element contributing to this ruler's "em-bare-ass-ment," if you will, and that was the willingness of the townsfolk to allow the emperor's naked march to continue.

For some reason — call it fear of an angry despot's wrath if you want, or perhaps this loyal populous was simply intimidated by the other residents;

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West Sees Disturbing Trends CONTINUED

seemingly unanimous agreement about the issue at hand: Indeed, the emperor's new clothes were splendid.

Just picture yourself as part of this crowd, all lined up to see the fabulous new robes that were so long awaited. Everyone in the town was aware of the special tailor the emperor had hired especially for the job, so expectations were high. When the magic moment arrived, the whole town lined the streets to see firsthand just how regal and impressive their ruler would be. Truth be known, some of the townspeople probably stood a little taller, thrust out their chin a little further and felt a little better about themselves the slowly escalating murmurs of the approving viewers made its way down the street toward those still waiting. After all, this was a relatively poor town, and much of the residents' wealth had gone to paying the tailor to spin the finest threads for their No. 1 citizen. Who wouldn't be proud of this?

There was just one problem, as well all know. There were no new robes. The tailor hadn't produced anything for the emperor to wear whatsoever. And this is where the real problem began — the vanity of the emperor forced him to accept the tailor's claims that he had in fact spun the valuable threads into wonderful new robes, despite the fact that no one could see them. But the tailor carried himself and spoke so confidently. Well, he wasn't crazy, was he? Of course not, because the emperor would never have hired or listened to an insane man.

So the emperor shed his garments in favor of the new "silks," and embarked on the scheduled parade through the town's square. As he paraded down the street, displaying the genetic handiwork of his parents more than any fine fashion, the people he passed were swept up one by one by the growing tide of admiration for what they were sure they must see (despite what their eyes and minds told them).

Well, unbeknownst to many people, another "emperor" continues a similar waltz down the street today, and everyone standing around talks admiringly about what they see. In this case, however, we haven't heard wondrous stories about gold and purple gowns. No, this time the public murmurs echo environmentalists' claims about the evils of pesticides and risks posed to people, pets and the environment through the use of these products.

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West Sees Disturbing Trends CONTINUED

The problem is that, thus far, the innocent little boy or girl who will so naively speak the truth — “Pesticides aren’t the problem” — has yet to be heard from. Instead, the march continues on, and the crowds lining the streets continue to echo the sentiment they are sure they are supposed to say: “Pesticides are sooooo dangerous. They have to go away. People who use pesticides don’t care about the environment.”

And, to be fair, the notion that pesticides are dangerous is close to accurate, with the exception of the verb. Pesticides in and of themselves are not dangerous in the least bit. However, they can be dangerous if they are used incorrectly. In the face of environmental sentiment and increasingly vocal activists who brandish children and puppies as instruments of battle, however, people accept that pesticides must be villainous.

Don’t get me wrong — I’m all for protecting tomorrow’s generation and our family pets. But contrary to the whispers on the street, banning pesticides isn’t necessary to accomplish this. The fact of the matter is that pesticides are some of the most heavily regulated products on the planet, each one requiring upwards of a \$10-million investment and 10 years worth of research before it can ever be sold.

Unfortunately, now, the issue is getting out of hand. No pesticides can be used on certain school properties in Los Angeles. Never mind the increased populations of fleas, ticks and termites that are certain to arise. Don’t worry about the weeds pushing up through the cracks in the sidewalks. And don’t concern yourself with any rodents that may nest inside classroom walls. Those children are safe now, at least according to the anti-pesticide groups.

The state government of New York, in all of its wisdom, has also taken steps to protect its residents by legislating that no pesticides can be sprayed to lawns in that state without notifying all abutting neighbors within 150 feet at least 48 hours in advance of the application. Of course, what the environmentalists who lobbied for this law for years don’t tell you is that lawn care companies will now have to apply more pesticides to provide the level of control their customers demand. Because lawn care operators will not be able to immediately spot treat any problem areas they detect on a

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West Sees Disturbing Trends CONTINUED

property, weeds/diseases/insects have an additional two days to spread, thereby requiring application of greater amounts of product to achieve control. In fact, this law is directly counter to the Integrated Pest Management the lawn care industry advocates for reduced pesticide use.

A report in last year's Boston Globe linked breast cancer to lawn care work because the "scientific study" found that more affluent women were more likely to get breast cancer and were more likely to hire a professional lawn care service. Of course, what the study didn't mention is that more affluent women are also more likely to drive luxury cars with leather seats, have clothes frequently dry cleaned or even be readers of the Boston Globe and thereby come in contact with the chemicals used to produce its ink. Obviously, there is no basis there for claiming luxury cars, dry cleaners or newspapers cause cancer. But that didn't stop the people behind that study from making that connection about lawn care, and it didn't stop one of the country's most respected newspapers from publishing the study.

All the while the media and general public continue to get excited about reducing pesticide inputs into the environment. But they continue to ignore the fact that pesticide consumption is down nearly 40 percent since 1979 in turf applications, and this is according to the U. S. Environmental Protection Agency. Why do they ignore this fact? For starters, anti-pesticide factions see little benefit to crediting lawn care and related industry for steps in the right direction. That might actually indicate that this industry knows what it is doing and is sensitive to issues of pesticide application.

What is most disturbing about this trend is that the environmentalists seem to be getting more passionate about their agenda as they parade past more onlookers who tell them, like the emperor mentioned above, how great they look. Instead, the general public hears one-sided reports about the dangers of pesticide and it simply accepts that these claims must be true.

Well, the time is here for the truth to be known. Yes, pesticides can be dangerous — if they are used incorrectly. The same is true for electricity, which is why people don't fix their own wiring problems. They hire a professional electrician. And that is exactly

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West Sees Disturbing Trends

why consumers should look to professionals to provide them the lawn care service they desire. Aside from the fact that certified lawn care professionals are best equipped to diagnose soil problems, identify weed, disease or insect problems, or prescribe necessary remedies to the problem, these are also people who are trained to handle and apply pesticides in an effective and environmentally friendly manner.

Pesticides are not the problem — pests are. As such, eliminating the pesticides will only exacerbate the problem, not fix it. Anti-pesticides groups — unfortunately, that has become synonymous with “environmentalists” in some instances — have spent a lot of money to tailor their message, and they’re very excited about showing it off to the townspeople. After all, we’ve heard so much about the diminishing rain forest and increasingly porous ozone layer, and those are certainly problems for us to concern ourselves with. But let’s not get so distracted by what we’ve heard that we simply go along with the crowd and say what they think we’re supposed to say. Protecting the feelings of one group at the real interests of our own simply isn’t worth that.

The viewpoint voiced by the guest columnist reflects solely the viewpoint of the writer. It may or may not be representatives of the beliefs of Plant Health Care, Inc., its employees, investors or others related to the company. The guest column is included in the PlantHealthCare.com Online Magazine to prompt discussions. Responses, which may be posted, are encouraged. See response options below.



The Secret Life of Plants in Winter

By Felicia Gillham, Managing Editor

For those of us in cold climates, the short days and freezing nights of winter represents a struggle of sorts—to live and thrive or to die like an ice cube.

Our battle with the elements, for the most part, isn't difficult. Thermal underwear, gas furnaces and full pantries make winter a season of the year that is just colder than others. But for trees, winter is a threat to survival that, when it is successful, is a triumph of genetic adaptation.

All organisms, be it man, oak or paramecium, are guided by the need to survive. The reason is gloriously simple. All organisms have a genetic imperative to pass on their DNA to their progeny. However an organism procreates, whether it disperses seed or divides like the paramecium, survival is critical to allow the transfer of DNA to succeeding generations.

The act of survival, however, requires an organism to triumph over the stresses that life has to offer. In the plant world in cold climates, winter temperatures represent some of the harshest stresses.

Organisms in cold areas follow one or more adaptations to survive winter. They can remain active, they can migrate (or seek shelter), they can become dormant, or they can die.

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The Will to Survive Winter CONTINUED

Dying is an adaptation that annual plants use to survive winter—they simply avoid it. Instead, annuals put all their life strategies into place in a single warm season. Through spring, summer and fall, annuals germinate, thrive, grow, flower and most important, seed, before winter's frost kills them.

Biennials and herbaceous perennials, on the other hand, “migrate” to survive winter. They go underground, in a sense, using the soil as shelter. Their roots and crowns remain snug and warm in the soil, while their tops are allowed to freeze and die. “Hiding” their precious food stores underground in roots and tubers ensures that springtime will issue a second season of growth for biennials, time enough to thrive again and seed.

Because they have relatively short life spans, the seeds of annual and biennial plants have excellent chances of sprouting and later forming seeds of their own. Larger plant forms, such as trees and most shrubs, require multiple seasons to produce vast quantities of seeds that as time passes may produce a single seedling that survives to tree status. The process of fertilization in a pine requires a year for its pollen tube to reach and fertilize the “egg.” Once fertilized, the egg remains in the cone for an additional year while it gathers food stores, and only after the cone dries and opens is the seed dispersed.

Due to their imperative to successfully seed, trees cannot force an entire life-span of growth into a single season, like annual plants do. Because of their size, trees cannot follow the method used by biennials and allow their entire top-growth to be killed each winter. Instead, they must go dormant.

Like hibernating animals, trees and shrubs (woody plants) note the cues of coming winter when daylight hours become shorter and temperatures fall lower. They hunker down. Nutrients are reshuffled from their leaves to their stems and roots. Deciduous leaves are dropped, and conifers are protected by the waxy cuticle found on their “leaves.” In anticipation of winter, the plants set buds. The trees, with slowed metabolic systems, come to a rest. They become dormant, much as some animals hibernate.

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The Will to Survive Winter CONTINUED

As trees drop their leaves, animals in anticipation of hibernation develop thicker fur. As their metabolisms slow for the winter, animals face the same struggle for survival as trees face—the need to keep ice crystals from forming in their body cells. Hibernating animals are either frost tolerant (they have the ability to survive freezing) or they are frost resistant—they produce chemicals that work as an antifreeze to keep ice crystals from forming. In the case of warm-blooded animals heat of metabolism maintains body temperatures above freezing during hibernation.

Trees, too, go dormant to prevent ice from forming within their living cells. Note, this does not include the xylem, since it is made up of dead tissue. But in the phloem and other living cells of the tree, the expansion of ice crystals within cells can rupture cell membranes and cause their death.

There are two different adaptations that woody plants use to thwart the dreaded ice crystal. They either supercool or purposely dehydrate their plant cells.

Most temperate woody plants use supercooling. These plants use dissolved solutes as a tempering device. Water entering or already existing inside the plant cells may be cold enough to create crystals, but the warmer dissolved solutes keeps the ice water liquid throughout the winter. The plants are not damaged, because technically, they are not frozen. You can consider these plants to be frost tolerant.

The remaining temperate woody plants, those that can withstand the lowest temperatures, use desiccation or intracellular dehydration to survive. They can be considered frost resistant. Water in these plants do not supercool—the water is actually allowed to freeze. The plant is not harmed, however, because ice crystals are not allowed to form inside their plant cells. It is a fine distinction. Water is allowed to freeze, but only in the extracellular spaces around the cells. When this occurs, the frozen water creates a high vapor deficit that pulls liquid water out of the living cells. The lower the temperatures, the faster the speed of water loss. As water moves out from the cells, it then freezes in the extracellular space. The cells desiccate (lose water), but the ice outside the cell walls cannot reenter—pores in the cell wall allow water out but ice is too large to go in.

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The Will to Survive Winter CONTINUED

Although desiccation allows survival of trees to temperatures as low as minus 40 degrees F., desiccation is a circular challenge. As plant cells remove water, they must also avoid total desiccation. The hardiest trees are those that tolerate the most desiccation or the driest cells. Trees that use intracellular dehydration to survive the winter are more often injured by dehydration than by freezing.

Although many of the Earth's plants are not in temperate climates and do not need to "go dormant," the ability to survive desiccation is an adaptation that allows us to enjoy the shade of trees in summer, lumber to build our homes and forests that keep our atmosphere clean. The ability to survive desiccation is what allowed plants to move from water to land 425 million years ago.

According to the fossil record, our first plants were single cell and filamentous blue green algae. Water was their environment; they could not survive or reproduce without it. Movement onto land became possible when Bryophytes developed waxy cuticles that allowed the primitive plants to retain water (not desiccate), similar to the waxy cuticle used by today's conifers and other trees. Coupled with the adaptation to survive desiccation was the Bryophytes' ability to produce their gametes (unfertilized eggs) in an organ that protected them from drying out.

This winter, as we enter our own type of hibernation—catch up on bookkeeping, cleaning the equipment and making plans for another year of maintaining plants—take a moment to look out the window and appreciate the glory of the survival of trees in winter.

About Planthealthcare.com Online Magazine

PlantHealthCare.com Online Magazine is posted at www.planthealthcare.com for professionals who produce, design and maintain plant material in the arbor, landscape architecture/design, landscape maintenance, nursery/greenhouse, and parks and recreation industries. Published as an educational service by Plant Health Care, Inc., the PlantHealthCare.com Online Magazine is designed to engage, educate and inform professionals about new technologies that promote the health of plants, specifically those that create “sustainable” landscapes that cost less, provide more value and last longer. The magazine also seeks to open discussion about issues that impact the many businesses that serve the plant health industry.

Meet Your Editors

Bruce F. Shank Editor

Bruce Shank is owner of BioCOM, a horticultural communications company based in Palmdale, CA. He is the editor of *Irrigation Business & Technology*, managing editor of *TurfGrass Trends*, and former editor of *Landscape & Irrigation*, *Landscape Management* and *sportsTURF* magazines. He was graduated by the University of Missouri—Columbia with a degree in agricultural journalism in 1973. He is a past president of the American Society of Business Press Editors and a member of the Turf & Ornamental Communicators Association.

Felicia L. Gillham Managing Editor

Felicia Gillham is owner of Gillham & Associates Marketing Communications, a San Diego, CA firm she established in 1989 to service the needs of turf and ornamental, agricultural and biotechnology companies. Articles written by Gillham on behalf of her clients have appeared in more than 100 Green Industry and farm trade publications. She is a 1980 graduate of the University of Missouri—Columbia with a degree in agricultural journalism. Gillham is a member of the Turf & Ornamental Communicators Association, American Agricultural Editor's Association and the National Association of Farm Broadcasters.

Meet Your Editors

Bob West Guest Columnist

Bob West is the editor for the Lawn & Landscape Media Group. As such, he is responsible for the editorial product for *Lawn & Landscape* magazine, *Interior Business* magazine, *Snow Business* magazine and *Irrigation Business & Technology* magazine. Under his guidance, *Lawn & Landscape* won the prestigious National Editorial Excellence Award from *Folio: magazine*, and these magazines have won various other awards from the American Society of Business Press Editors, Society of Professional Journalists, and Turf and Ornamental Communicators Association. West graduated from Ohio Wesleyan University with a bachelor's degree in journalism and English.

Calendar of Industry Events

October

4-5

Turf and Landscape Equipment Expo, Costa Mesa, CA. Sponsored by the Southern California Turf Council. 800-500-7282

4-6

Southern Nurseryman's Association Convention, Atlanta, GA 770-953-3311

13-14

Plant Biology Workshop, Plant Health Care, Inc. Education Center, Frogmore, SC, 888-290-2640

18-19

California Association of Nurserymen Western Nursery & Garden Exposition, Las Vegas, NV, 800-748-6214.

23-27

Hawaii Mid-Pacific Horticultural Trade Show and Conference, Hilo, 808-969-2008.

27-31

American Society of Landscape Architects Annual Meeting, St. Louis, MO 202-898-2444

November

3-4

Plant Biology Workshop, Plant Health Care, Inc. Education Center, Frogmore, SC, 888-290-2640.

3-7

Green Industry Expo, Indianapolis, IN, 800-458-3466.

9-11

National Arborist Association TCI Expo, Charlotte, NC, 800-733-2622.

12-14

Irrigation Association International Irrigation Show, Phoenix, AZ, 703-536-7080.

Calendar of Industry Events

CONTINUED

14-16

Virginia Turf & Landscape Conference, Virginia Beach, 540-942-8873.

14-16

Pennsylvania State Golf Conference, State College, 814-863-1017.

14-18

California Landscape Contractors Association Annual Conference, Hawaii,
800-448-2522.

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Vermont Greenscape Association, White River Junction, 802-773-7833.

29-Dec. 2

Rocky Mountain Regional Turf Association Conference, Denver, CO, 303-770-2220.