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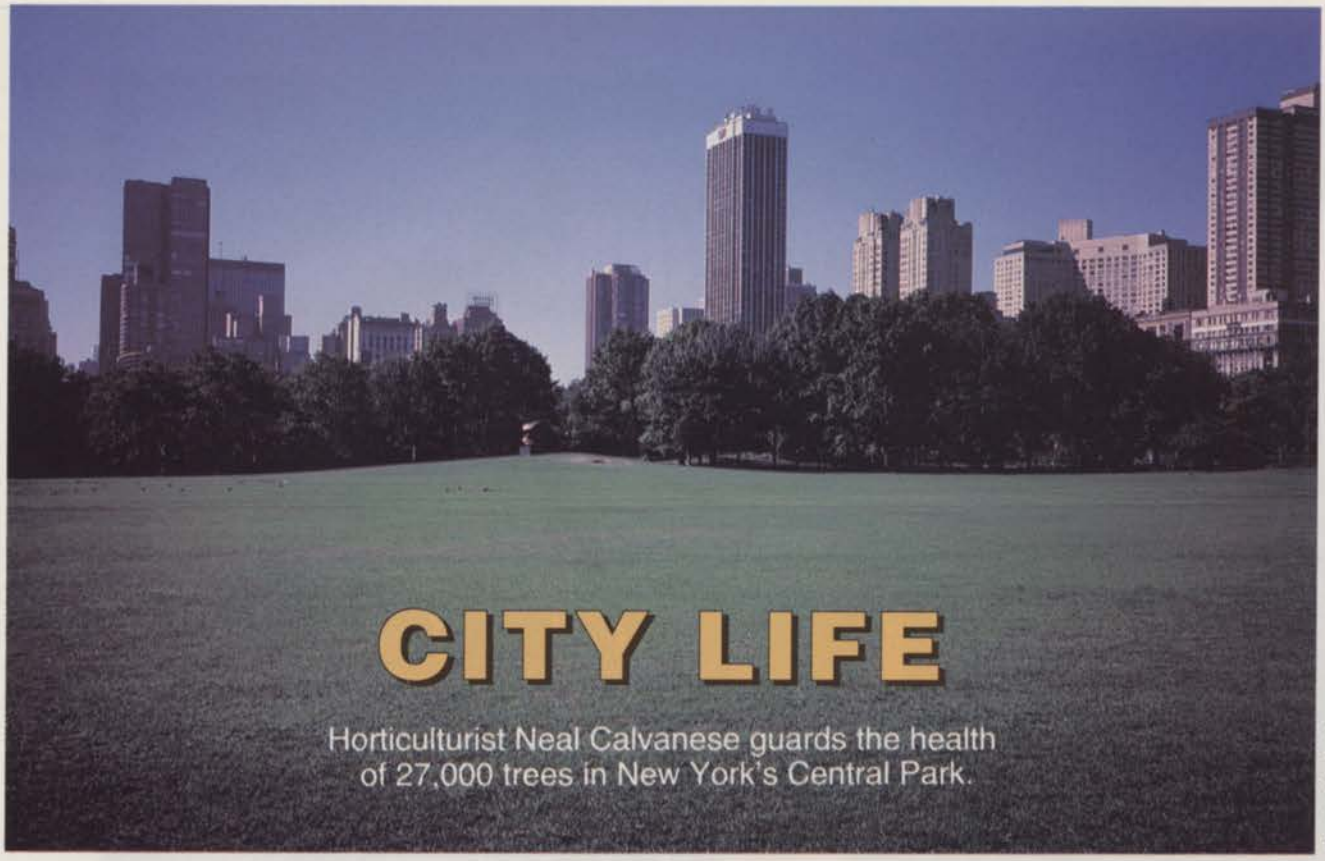


CITY LIFE

Horticulturist Neal Calvanese guards the health of 27,000 trees in New York's Central Park.

Central Park Conservancy

"When I tell people that America's largest and most important stand of American elms thrives in the center of Manhattan, they sometimes look at me like I'm crazy," says horticulturist Neil Calvanese.

"But in Central Park, there are 2,500 elm trees, of which more than 1,800 are American elms–one of the last remaining perfect stands of American elms anywhere–and the second dominant species of trees in the park, the first being black cherries." For Calvanese, Director of Horticulture for New York City's Department of Parks and Recreation, elms are a passion.

"Whether American, English or Chinese—and we do have many varieties in the park—they are a magnificent tree," says Calvanese. "Their unique arching forms great cathedral-like spaces. They have a wonderful vase shape, pendulous limbs, full branches and their leaves provide beautiful color, not only in the fall, but all year long. They are truly a tree for all seasons."

Help from private sector

Efforts to keep the elms—as well as the parks 25,000 other large trees—healthy and well puts heavy demands on Calvanese and his staff who care for Central Park's vulnerable collection of trees.

"During the New York City fiscal crisis 10 years ago, there were only two gardeners maintaining the hundreds of acres that make up Central Park, one of the largest urban green spaces in the world," says Calvanese.

"Today, thanks to over 20,000 donors who contribute funds each year to the Central Park Conservancy, I have a staff of as many as 45 gardeners who fertilize, seed and mow the meadows, maintain ballfields, weed, mulch, prune, plant and care for our trees."

The effort to keep Central Park's elms healthy is also made more difficult by the scourge of Dutch elm disease. "While the disease has decimated the American elm population throughout the country," says Calvanese, "fortunately, due to close monitoring and careful maintenance, few of our Central Park elms have been lost."

"The disease is difficult to control because it is a fungus that develops inside the tree's xylem, the veins carrying water to the crown of the tree.

While there is little that can be done once Dutch elm disease has progressed into the main stem of a tree, Calvanese uses instant photography to record its effects. "By taking a series of instant photos and studying them over a period of time, we gain information on how tree diseases spread and how their effects may vary from one species of tree to another.

Keeping a record

"Also, when a tree needs to be removed due to disease or damage, we need to document the reason for its removal. New Yorkers are very protective of Central Park, and many of them have a favorite tree of trees, and we often hear from them when they discover a tree has been removed. With a Polaroid photo in our file, we can indicate the tree was a hazard due to disease, rot or storm damage. We don't like to have to take trees down, but when it becomes necessary, at least we can show a tree lover why his or her favorite had to go."

The big advantage in using instant photos, says Calvanese, is that it makes an on-the-spot record. "There's no waiting to see if you got the picture you needed. You know instantly, and that's important when a tree is about to go down and you're not going to have a second chance to get that photo you need."

Calvanese is quick to add that park policy calls for replacing—if possible—removed trees with another tree of the same species and, hopefully, of the same size.

Instant photography also helps when buying replacement trees. "Much of my time is spent dealing with commercial nurseries, from whom we buy replacement stock for the park," says Calvanese. "We will visit a nursery, take a look at their

inventory, and take instant photos of those trees we think may be suitable for purchase.

"The instant photos are brought back to my office, where they are reviewed by the Conservancy's land scape design office. Once the trees in the photos have been approved—their shape, color and size are all taken into consideration by our designers prior to purchase and installation—we issue a purchase order."

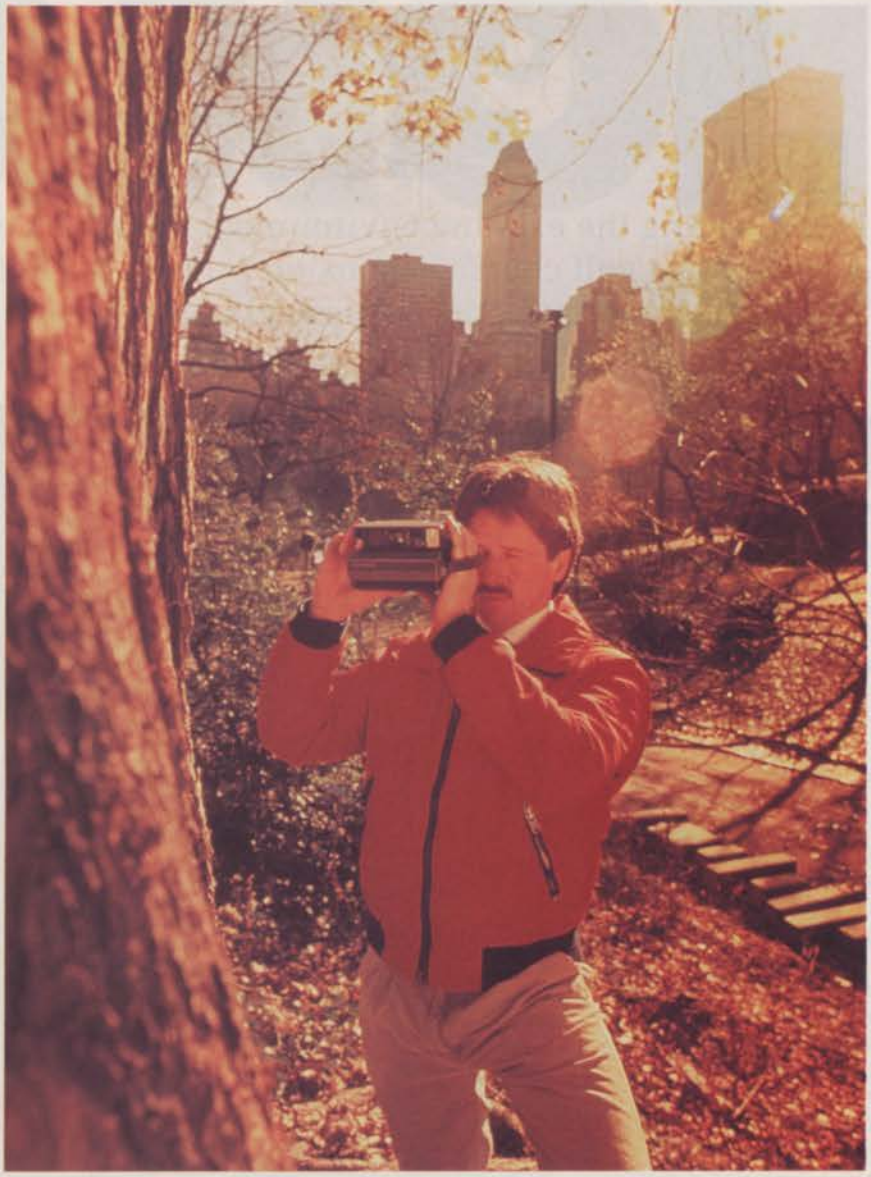
28 million feet

Approximately 14 million people walk the park each year. The traffic makes for a severe soil compaction problem.

"We continually aerate the soil in heavy-use areas with a machine that penetrates three to four inches into the dirt, breaking it up so that air and nutrients can get into the ground, allowing it and the plants it supports to breathe."

'By taking a series of photos over time, we gain information on how tree diseases spread, and how their effects vary from one tree to another.'

—Neil Calvanese
Central Park horticulturist



With instant photography, Neil Calvanese documents tree problems on the spot. (Photo by Jake Wyman)

Calvanese says it is this constant attention that keeps Central Park looking as green and beautiful as it does. "In addition to aeration, the Conservancy maintains an ongoing program of fertilizing, overseeding, irrigation and pruning. You really have to keep at it all the time. If we were to discontinue our efforts for only one year, Central Park would, in many places, become a dust bowl, due primarily to its heavy use by the public."

However, both public events as well as special uses for which permits must be obtained—movie shoots, magazine photo sessions, construction projects—mean Calvanese again turns to his instant camera for help.

"Occasionally, we need to produce evidence that the condition of a section of the park was in good order prior to damage that may have resulted from a permitted activity. In the case of a disagreement, having instant photos showing 'before and after' conditions can be very helpful."

Calvanese says the birth of the Central Park Conservancy in 1980 has helped the park to flourish today. "The Conservancy is a non-profit organization which works in partnership with the New York City Department of Parks and Recreation. During the past 10 years, the Conservancy has raised $64 million for the upkeep of the park and has, in addition, become a national model for such public and private partnerships."

Calvanese himself has been working at Central Park for nearly 10 years. "After graduation from The State University of New York at Farmingdale with a degree in arboriculture, I started my job search. One day, while unemployed, I visited Prospect Park in Brooklyn and saw a Camperdown, or 'weeping' elm. The tree was magnificent. It was at that moment I said to myself, 'this is it! I want to work with trees!' Not long after that, I started work as a tree-climber on the Central Park tree crew, going up into the trees to do whatever work was required."

Calvanese says that 10 years from now, "I'll probably be right here." Then he turns and looks out his small Central Park office window at a grove of majestic elms, their leaves fluttering in the slight breeze, their long limbs reaching to the sky.

"But I do see myself in the woods someday. Doing what? I don't know. Probably still helping to make sure trees grow up strong and healthy." **LM**

TO BUILD AND PRESERVE

Protecting the existing environment must be a major concern when planning a golf course expansion project. It's not an easy task, but an important one, as these planners recently found out.

by Jack Simonds, contributing editor

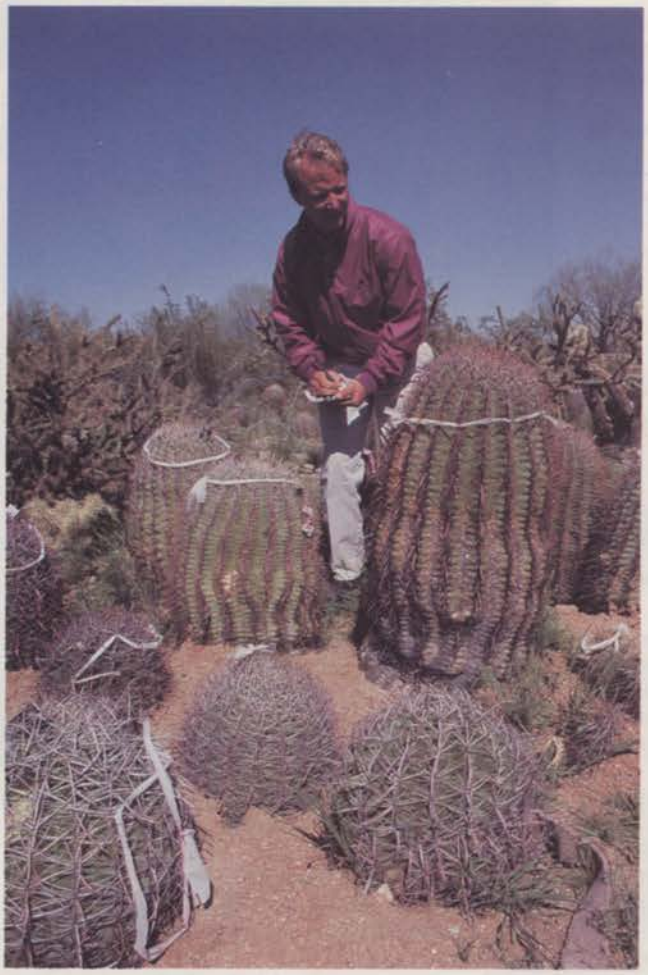
The Boulders, a $50 million showcase resort by Westcor—nestled on 1300 acres north of Phoenix—commissioned a nine-hole expansion last summer of its "target style" 27-hole course. It meanders through Ansel Adams-like rock formations and desert land marked with the unique saguaro cactus.

"To go in and match a golf hole to the natural terrain is the real challenge. More time was spent on that than will be to build the actual golf course," says project manager John Miiller.

Miiller relates how great pains were taken to gently remove mesquite, paloverde, prickly pear and acacia cat claw trees, hedgehog cactus and ocotillo shrubs to temporary nursery sites. The terrain's signature saguaro cactus plants, found only in the Sonoran Desert, were moved and transplanted once to areas out of golf play.

The precious and fragile nature of the saguaros made it necessary for only one transplant, project horticulturalist Dave Hutchinson believes.

"When we're dealing with something as fragile as the saguaros, we like to move them just once," Hutchinson says. Some of the majestic plants are up to 300 years old.



Marc Snyder takes a "cactus inventory." The plants are moved once and once only.

Working from nature's blueprint

Hutchinson, Miiller and course superintendent Marc Snyder began the work by taking inventory of all plant life in the area, noting the contours of the land for wash crossings and high ground to set up natural drainage.

"We just use the natural contours that exist," Snyder says. Rainwater collects at those wash crosses, and a few figure into the play of a hole.

An underground Rain Bird system provides irrigation in peak dry seasons. The state-of-the-art equipment closely monitors water use in a state with fairly strict water allocation restrictions. Submerged sprinkler heads deliver water in dry times.

"When we first started, we looked at the land and selected it first," says Miiller. "We decided: 'Here is where a green would fit; here is where a fairway should go; here is where it makes sense to do some planning from a desert standpoint."

Snyder agrees: "We have man coming into nature and building this (resort and golf) community. We want to live in harmony with nature and be sensitive to the environment. In everything we do, we want to be consistent in man and nature living in harmony. As a golf course superintendent, I'm proud of that."

Finding room for fairways

Course designer Jay Morrish also saw the advantage to incorporating rock formations and wash crossings into the expansion, but a bigger problem vexed him during several months of early design work.

"The big challenge for me was to determine how to get another nine holes in the site and be able to tie it all together," says Morrish, a Tulsa, Oklahoma course designer who works both solo and with professional golfer/course designer Tom Weiskopf. The problem, Morrish says, is that The Boulders complex—packed with 136 guest houses, two swimming pools, tennis courts, restaurants and other fineries—had not included more fairways in its original land plan.

"But now everything looks good and I'm very excited about it," Morrish says.

When plants are put back, Hutchinson notes that only vegetation indigenous to the High Sonoran region is included.

"There will be no new species

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whatsoever," he vows.

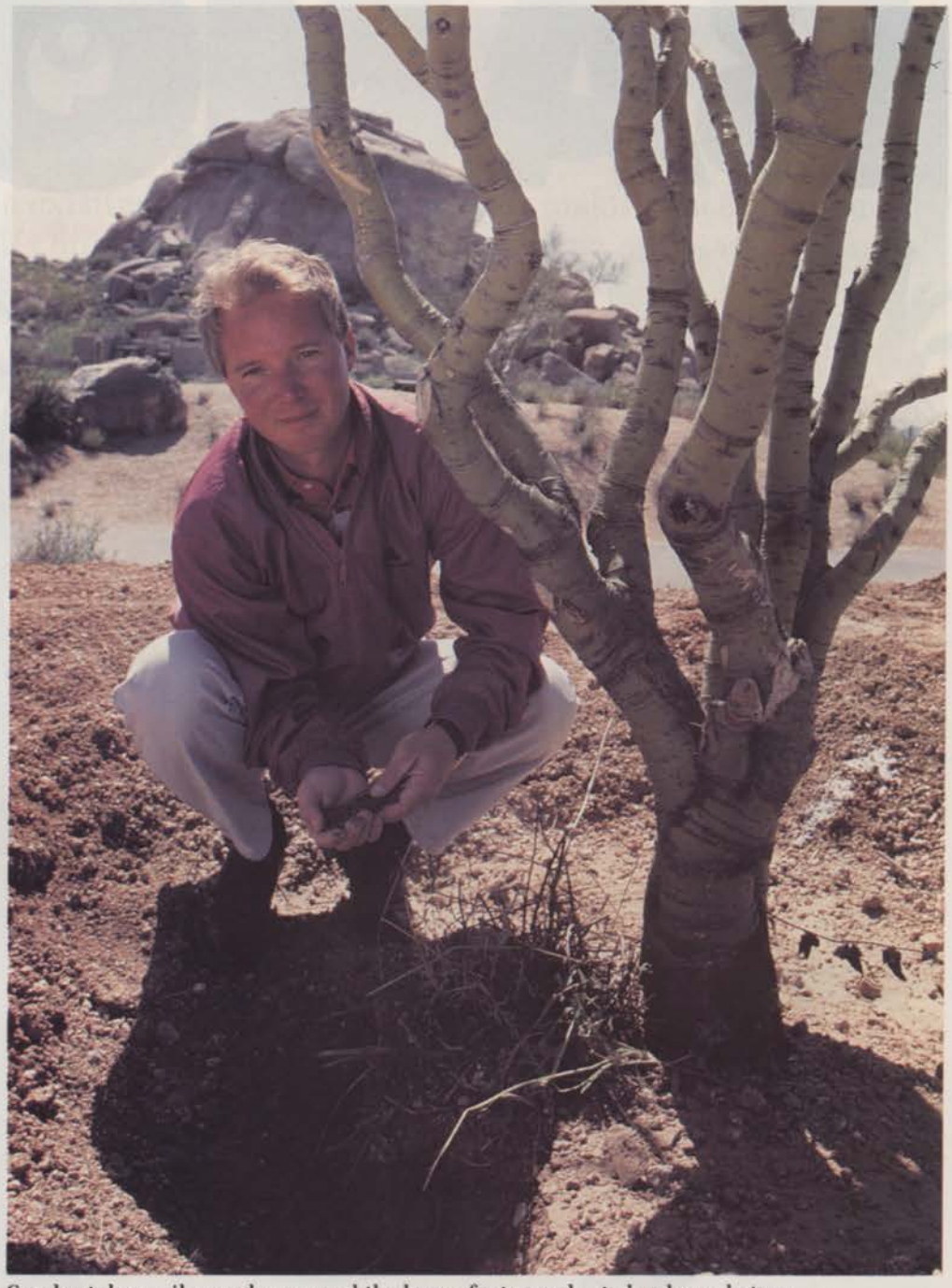
And the course itself?

"The best description I can give," Snyder says, "is that it is more of a target golf course. When you tee off, you cross an area of desert to get back to grass."

Most of the holes are islands of tees, fairways and greens; a few are complete in the traditional sense. Fairway landing space is about 300 to 400 feet across. Hazards include standard bunkers to give the hole shape. The austere rock outcroppings that give the area its haunting beauty and the exclusive resort its name also serve as challenging traps. Those outcroppings were formed 12 million years ago.

"The outcroppings and boulders fit right into the natural design," says Snyder. "We use them to our benefit."

Finish grading and grassing programs began in April; the new nine will open in mid-September. Grassing itself is a mixture of varieties and maintenance programs.



Snyder takes soil samples around the base of a transplanted paloverde tree.

Bermuda, rye and bentgrass

Snyder explains that fairways and roughs are seeded with a bermudagrass and overseeded with perennial ryegrass during peak dormant season in winter. Bentgrass is used on greens.

Snyder and his 36-man crew also maintain a 45-foot lip of desert around all green areas which serves as a buffer between playing surfaces and the Sonoran Desert proper.

"If someone hits it in there, they can play it out," he says, likening the buffer to out-of-play forest bed areas found on traditional golf courses.

"We don't want it to be too manicured. We just want that natural look and the manicuring we do is blended in with the desert that we don't maintain," Snyder says.

That 45-foot lip is maintained by pruning programs, plantings and timed pre-emergence herbicide sprayings. After that, the buffer is left to "Mother Nature taking its course," says Snyder.

Regional animals remain

All connected with the expansion agree that close care has been taken to insure the desert beyond is not disturbed. Wildlife like deer, coyote and hawks still call it home.

"When we're finished, we won't have to go in and repair the desert. We've changed only what we needed to change," says Snyder.

Hutchinson agrees: "We've made it so that revegetation by and large is not necessary. We're using those plants to create a habitat and maintain the integrity of the desert while adding to the experience of golf."

The Boulders Sonoran Desert resort itself has been designed to blend with the surrounding outcroppings and has received the 1990 Small-Scale Commercial/Retail Development Award for its planning design among other awards. About 90 percent of resort-owned land remains undeveloped. **LM**

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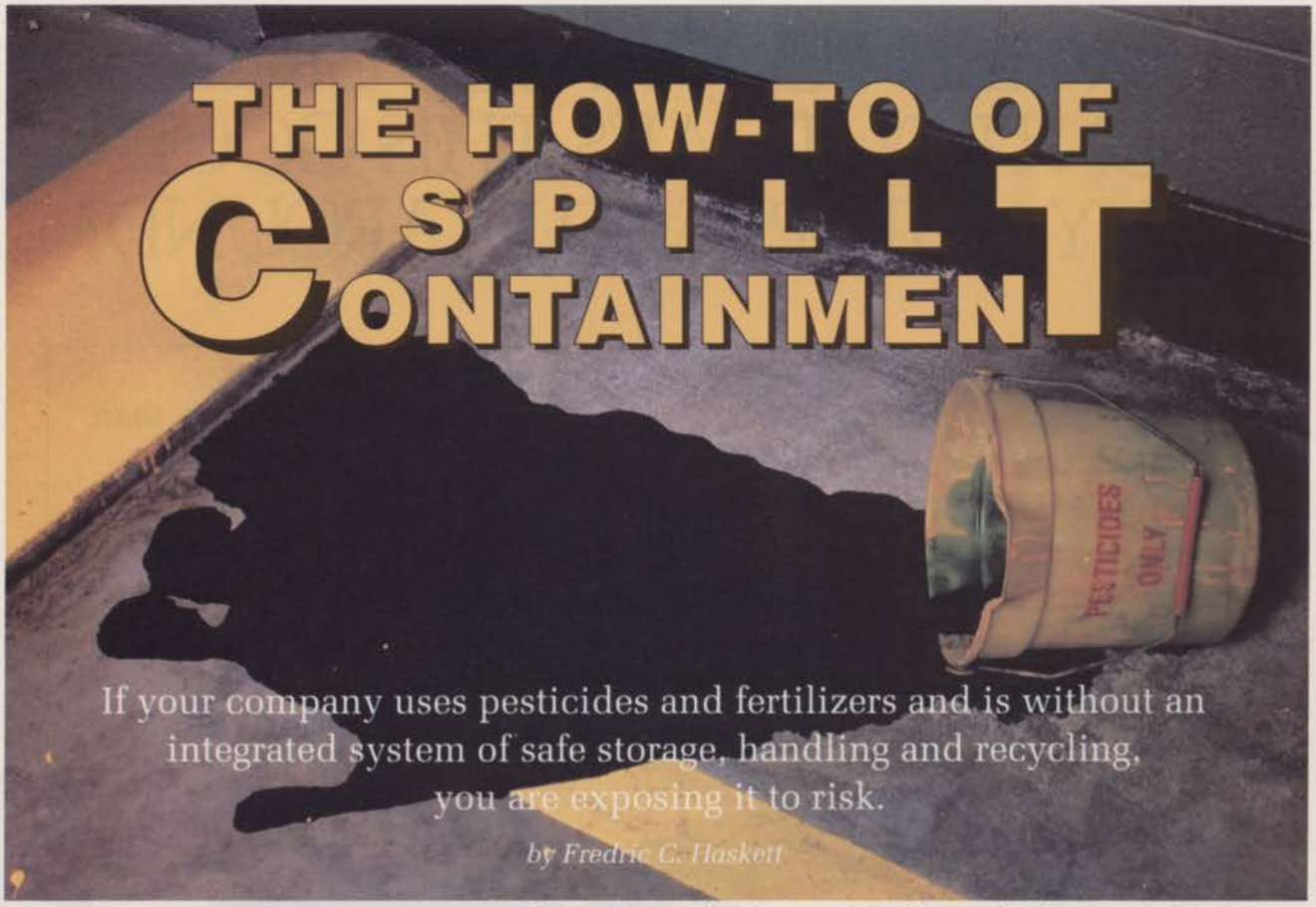
THE HOW-TO OF SPILL CONTAINMENT



If your company uses pesticides and fertilizers and is without an integrated system of safe storage, handling and recycling, you are exposing it to risk.

by Fredric C. Haskett

Secondary containment areas must be diked and treated with watertight, chemical resistant materials.

Industries that use pesticides and fertilizers are being watched by a host of different groups: federal and state environmental protection agencies and departments of agriculture, local governments and environmental groups, media watchdogs, insurance companies and the public at large.

Five states—Indiana, Illinois, Nebraska, Florida and Ohio—have either enacted or are working to enact containment laws. Proposed laws carry jail terms or civil penalties and heavy fines.

The questions you must ask yourself are:

- Can your facility stand up to this scrutiny?
- Can your operation comply with the new regulations?
- Do you know the legal and economic implications of compliance or non-compliance?
- Are you aware of the cost difference between recycling residues and rinsates, and of having them disposed of properly?

The cost of non-compliance

If you answer "no" to any or all of these questions, the results could be catastrophic. You could face retroactive fines, lawsuits, criminal and civil penalties, jail terms, negative publicity, large rate increases or loss of insurance, clean-up and disposal costs. And, you could lose your business. It has been estimated that the cost of residue and rinsate disposal for the average facility would range from $8000 to $15,000 annually. Clean-up costs from spills as low as one gallon of concentrate can range from $50,000 to $100,000.

Primary storage requirements

Examine where and how you store liquid and dry pesticide concentrates. This area should be sectioned off into a primary and secondary containment area.

The primary containment area is used for both storage and mixing operations involving concentrated pesticides. The area must be diked, and the floor and dikes treated or coated with watertight, wear resistant materials that are also resistant to chemical corrosion.

In addition, this area should be further segregated by a partition to control unnecessary or unauthorized access. Equipment such as spill recovery tools, emergency shower/eye wash, fire extinguishers and ventilator fan are also important parts of this area.

Secondary containment area

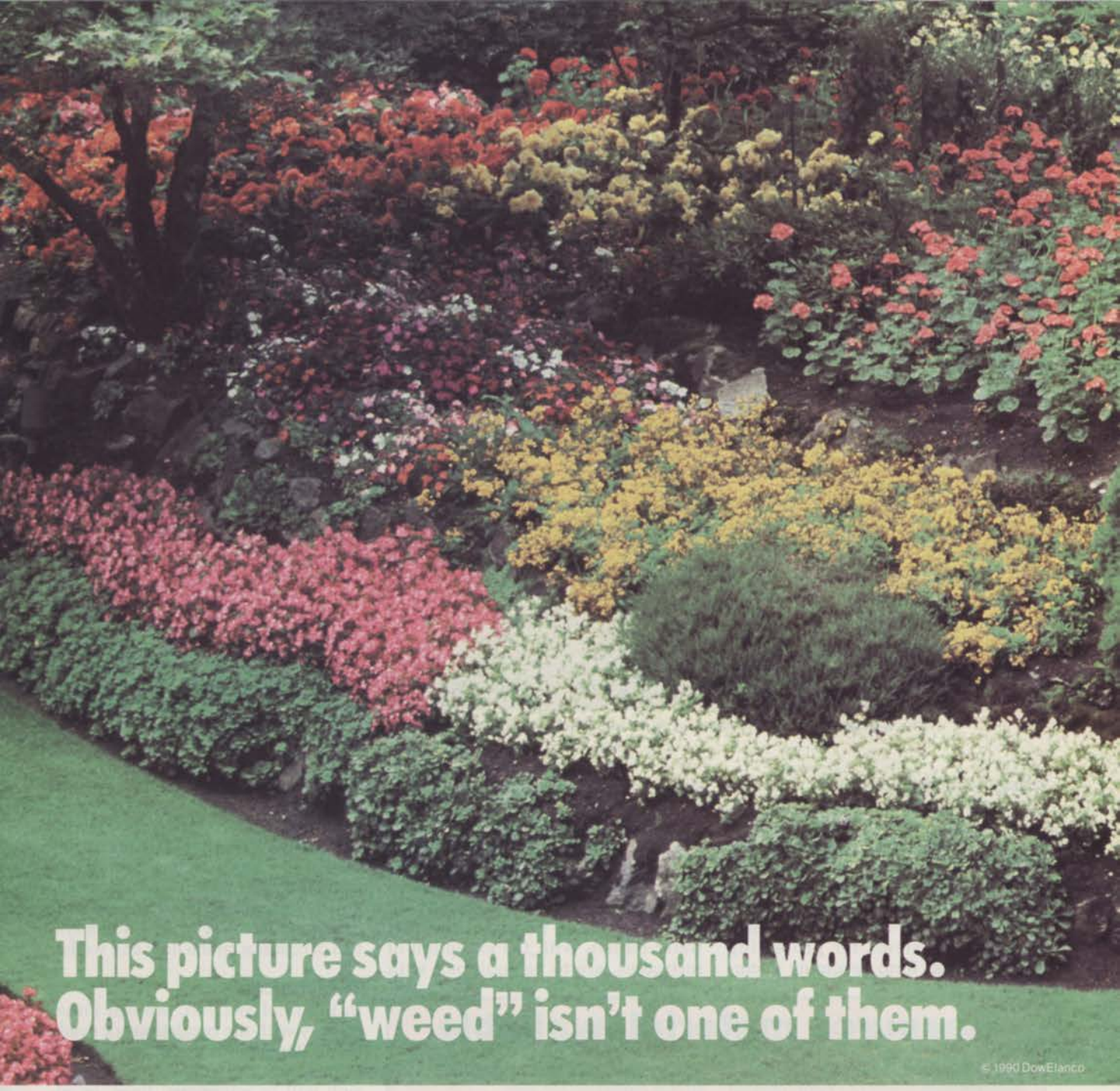
The secondary containment area is used for storing and parking spray rigs or trucks, for loading or fill operations with dilute pesticide mixes and fertilizers, and for washing and rinsing pesticide residues from application equipment and vehicles.

Dry fertilizers and the storage tank for recyclable dilute pesticide residue and rinsates are located here.

The secondary containment area can be sealed from adjacent areas with partial dikes at doorways and with floor and wall coatings that are resistant to chemical corrosion. As is the primary containment area, this insures that any spills or discharges within the area can be contained and recovered.

These basic concepts will bring safe and efficient storage, mixing, loading and clean-up.

Combining the two containment areas and their systems can reduce fill times while at the same time reduce the opportunities for mishan-



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The secondary containment area is used for storage, parking and load-and-fill operations.

dling, accidental spillage, unnecessary exposure and waste.

Recovering and recyling washwater, rinsates, dilute residues and waste concentrates is one of the most critical aspects of this operation. An effective and comprehensive recycling system can be one of the most important systems for protecting your business form becoming a storage site for hazardous waste.

Backflow prevention

The last benefit of a successful system is the protection it offers outside water systems. The primary tool here is a backflow prevention device installed at the main source. All water outlets, with the exception of restrooms, are to be equipped with anti-siphon devices for backup protection.

Additional protection for exterior groundwater areas and sanitary sewer and storm sewer systems is achieved with an integrated combination of containment dikes, self-contained recovery sumps, and a system of coatings on the floor and walls.

Two choices

In the final analysis, we can either comply with the regulations or evade them. Regulations are either in force or pending. The implications for evasion will be enormous: fines, criminal and civil penalties, negative publicity, shutdowns, lawsuits and waste.

Why should you use this system? There are several reasons:

1. After four years of operation, we know it works.
2. It is approved by the EPA and Ohio Department of Agriculture.
3. It can be used with new construction or retrofitted into any existing building.
4. It is easy to install, operate and maintain.
5. It is affordable, and uses available materials.

Most importantly, you will avoid the "status" of becoming a hazardous waste storage site, with the accompanying high cost of proper disposal. **LM**

Resource material available

Fred Haskett has put the steps toward safe pesticide containment into book form. The guide contains information that allows both large and small operations to design and construct an affordable, viable and safe chemical/fertilizer containment area.

Fred Haskett

Haskett's containment system:

- Can be used for new construction or retrofits.
- Provides protection from spillage and leakage.
- Significantly reduces or eliminates storage and disposal of chemical wastes or residues.

The Haskett system has been approved by the Ohio EPA and department of agriculture.

Cost for the guide book is $69.95 plus $4.50 shipping and handling. For more information, contact Haskett at Department LM, P.O. Box 336, Dover, OH 44622; (216) 364-5235. Allow two weeks for delivery.

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