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"You can't cut grass with headaches. That's why I switched to Buntun."

*Bill Wright, President
Lawn-Wright, Inc., Gaithersburg, Maryland*

"When I started my lawn service business seven years ago I had a push mower and riding tractor. It only took a year to realize I could cut a lot more grass in the same amount of time with one commercial walk-behind mower," says Bill Wright, president of Lawn-Wright, Inc. "Four years later I discovered Buntun. Now I can cut even more grass with the same number of mowers."

The reduction in maintenance headaches compared to his other mowers was so significant that two years ago Bill Wright replaced his eleven mower fleet with Buntuns. Here's why he just bought seven more:

Welded steel deck construction

"With Buntun, the deck is reinforced and welded into a single piece, not bolted together like other mowers. With no bolts to fall out, the problem of sagging decks and misaligned belts and blades was eliminated. Our maintenance went down and quality of cut went up."

Stronger parts/better engineering

"Other manufacturers make caster supports, bell cranks and other parts from aluminum, which breaks easily. Buntun makes them from steel, so they're more durable. And, Buntun has fittings at all critical wear points so parts can be greased to make them last longer."

Better belt system

"Because the belts are wrapped in straight lines without twists or back-bends, our belt life increased by at least five times when we switched to Buntun."

Variable speed drive system

"Buntun's pulleys are larger so we get better belt contact and less slippage, even when they're wet and going up hills. We also get a larger range of speeds with Buntun than with other mowers."

Savings of time and money

"There are many other features on Buntuns that lower my maintenance costs. Overall, I have saved at least \$6,000 in the two years since switching to Buntun, not including the added profit from increased productivity."

If you need more cutting capacity and fewer headaches, discover the profit in converting your fleet to Buntuns. Call for the name of our local dealer.

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A loader joins the army

While the Army Corps of Engineers makes every effort to allow maximum public use while protecting the environment, most of the 13 million visitors to Hartwell Lake don't think in terms of flood control and hydroelectric power. They come seeking relaxation in the outdoors.

The lake is the Army Corps of Engineers' second-most-popular recreation area in the United States, according to the Corps. Available activities include swimming, camping, waterskiing and boating in various combinations at over 80 public recreation areas, 56 of which are managed by the Corps.

Located along the Georgia and South Carolina border in the Piedmont region of the Appalachians, the lake's northern-most fingers stretch into the foothills of the Blue Ridge Mountains.

The Corps' four Bobcat loaders are ideal for the creation and maintenance of campsites and playgrounds and the paths running between them, the lake and other public facilities. The Bobcats maneuver well in small areas.

Railroad ties used extensively as steps and borders around walkways, campsites, picnic areas and playgrounds contribute to the area's natural appearance.

The ties also help to curb erosion. With a fork attachment, Bobcat loaders can maneuver the ties into place.

"They really save a lot on manpower," says assistant foreman Joe C. Higginbotham. "It would take several men all day to do what the Bobcat does in a few hours."

When hill-climbing is necessary, Bobcat loaders, unlike larger equipment, are very handy. Backing into a bank, Higginbotham demonstrates how by planting the bucket into the ground and pushing the Bobcat loader backwards up the mound of dirt a few feet. Then he repeats the process until he has maneuvered to where he wants to be.

"Here's one of the best you'll find," says foreman Dale Byrum. Smaller and more agile than larger bulldozers, Bobcat loaders can level awkwardly shaped camping pads quickly and easily. They also are useful when grading small parking lots.

"It took me just a few hours to do that," says Higginbotham, pointing to a small freshly graded parking lot near the entrance booth to Paynes Creek



The Bobcats maneuver well in small areas.

Campground. "And you can see how the edges slope down there. I smoothed them by dragging my bucket," he explains.

The loaders are useful on larger projects because they can do fine work around the edges, smoothing the surface and pulling rocks and debris from beneath the underbrush without damaging it. Unlike larger machines,

they can clear dirt from the mouth of a drainage pipe easily and without damage to the pipe or road.

Higginbotham and his crew are installing a vehicle pull-off area and telephone on the Paynes Creek Campground road. They'll use a loader to grade the pull-off. To preserve the forest's natural appearance, the telephone lines will be put underground, making it necessary to cut a narrow trench through the forest ground.

"When we get the line in, I'll take the Bobcat in there," said Higginbotham, pointing into the woods. "I can level it and clear the trees out without damaging the others."

The Corps also removes any dead or sick trees that may fall and cause damage or injury. Again, equipped with a fork attachment, a loader can remove the previously cut trees without harming surrounding growth.

In 1986, a small tornado whipped through Paynes Creek, twisting and breaking many trees. The loaders were useful in removing mangled trees from campgrounds and woods.

"Now I'm not bragging," says Higginbotham with a straight face, "but the Bobcats do have their place." **LM**



Bobcat loaders are ideal for the creation and maintenance of campsites and playgrounds.

The U.S. Army Corps of Engineers uses a variety of machinery to accomplish its maintenance work at Hartwell Lake. The Corps does not endorse any particular product over another.



Harvey Hardin

SUPERINTENDENT, BERMUDA DUNES

The only golf course superintendent to have hosted every Bob Hope Classic since the inaugural event in 1960.

“Bermuda Dunes is wall-to-wall Derby turfgrass and has been for six years. Since there are no cart paths except those around greens and tees, Harvey swears by Derby because it holds up.”

Golf Course Management, April, 1987

Circle No. 131 on Reader Inquiry Card

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PROBLEM MANAGEMENT

by Balakrishna Rao, Ph.D.

Fungicides for oak leaf blister

Problem: What can be used to manage oak leaf blister problems? We have used benomyl in the past and haven't had good results. When is the best time to treat for this disease? (Florida)

Solution: Oak leaf blister disease is caused by *Taphrina coerulescens*. Generally, the disease doesn't require any fungicide treatment, but if the disease is severe, the galls can distort the leaves which may be unsightly and eventually may defoliate. In these situations a fungicide treatment may be very beneficial. One application of fungicide before bud break is very important. Applications made after bud break are generally not effective.

Different universities recommend different fungicides as more effective. Some of the fungicides found to be effective are fixed copper, Mancozeb, Zineb, Maneb, Ferbam or Captan. Reports from Penn State suggest that one dormant application of Zineb 75 percent WP before bud swell in the spring is very good. Since benomyl is not recommended for this problem by extension personnel, consider switching to one of the above fungicides. Apply Mancozeb or Zineb at or just before bud break, or at the first sign of disease development. Read and follow label specifications for best results.

Fertilizer and Roundup

Problem: Is it true that the addition of fertilizer can increase the effectiveness of Roundup? What kind and rate of fertilizer is recommended? (New York)

Solution: Yes, it is true that the addition of fertilizer can improve the effectiveness of Roundup. Reports from South Dakota State University indicate that the addition of ammonium sulfate fertilizer to Roundup improved weed control by 40 to 60 percent. If the carrier is hard water, the product can be tied up and may not be properly absorbed by leaf surfaces.

Therefore, the addition of ammonium sulfate to the mix can reduce this tie-up and give better weed control. Their studies showed that when dealing with weeds such as downy brome (cheatgrass) it is best to spray just before the emergence of seedhead. This timing of application might be true with some other weeds too; however, further study is needed.

The labeled application rate for ammonium sulfate is 17 lbs./100 gal. of mixture. Try to use superior quality products.

To tank mix, first add the fertilizer through a screen and dissolve it in water in the tank. The volume of water and fertilizer should be two-thirds the total volume of mix required. Then add the herbicide to the tank mix. Read and follow label specifications for best results. Nonionic surfactants can also be used to improve control of some weeds.

Another approach is to mix 2,4-D or dicamba with

Roundup and apply on actively growing weeds. However, mixing these products may cause the formation of a white precipitate which can clog the sprayer nozzles. Pretesting would be required before mixing or using these combinations.

Disease-free plants

Problem: We come across a number of clients who ask for disease-free plants. A listing of disease-free plants would be useful in our landscaping business. Would you please provide a list. (Ohio)

Solution: Trees relatively free of disease:

*Atlas Cedar *Cedrus atlantica*; Amur Cork-Tree *Phellodendron amurense*; Bald Cypress *Taxodium distichum*; Beech *Fagus grandiflora* & *F. sylvatica*; and Cedar of Lebanon *Cedrus libani*.

Cedrela *Cedrela sinensis*; *China-Fir *Cunninghamia lanceolata* Cork-Tree *Phellodendron* sp.; Cucumber-Tree *Magnolia acuminata*; and *Dove-Tree *Davidia involucrata*.

Eucommia *Eucommia ulmoides*; *Franklinia* *Franklinia altamaha*; *Ginkgo* *Ginkgo biloba*; *Glossy Privet *Ligustrum lucidum*; and Golden Larch *Pseudolarix amabilis*.

Honey-Locust *Gleditsia triacanthos*; Hop Hornbeam *Ostrya virginiana*; Hornbeam *Carpinus caroliniana*; Japanese Plum Yew *Cephalotaxus drupacea*; and Japanese Raisin-Tree *Hovenia dulcis*.

Japanese Torrey *Torreya nucifera*; Japanese Yew *Taxus cuspidata*; *Kalopanax* *Kalopanax pictus*; *Katsura*-Tree *Cercidiphyllum japonicum*; and Kentucky Coffee-Tree *Gymnocladus dioica*.

Larch *Larix decidua* & *L. eurolepis*; *Magnolia* *Magnolia* sp.; Parrotia *Parrotia persica*; Pawpaw *Asimina triloba*; Persimmon *Diospyros virginiana*; *Phoenix or Chinese Parasol-Tree *Firmiana simplex*; and Sassafras *Sassafras albidum*.

Silverbell-Tree *Halesia monticola*; Snowbell *Styrax japonica*, *S. obassia*, & *S. dayantha*; Sorrel-Tree or Sour Wood *Oxydendrum arboreum*; *Stewartia* *Stewartia pseudo-camellia* & *S. koreana*; Sweet Gum *Liquidambar styraciflua*; Tree-of-Heaven *Ailanthus altissima*; *Tupelo* *Nyssa sylvatica*; Turkish Hazelnut *Corylus colurna*; Umbrella-Pine *Sciadopitys verticillata*; *Yellow-Wood* *Celastrus lutea*; and Yew *Taxus* sp.

*Trees generally hardy only as far north as southeastern Pennsylvania.



Balakrishna Rao is Director of Lawn Care Technical Resources for The Davey Tree Co., Kent, Ohio.

Questions should be mailed to Problem Management, Landscape Management, 7500 Old Oak Boulevard, Cleveland, OH 44130. Please allow 2-3 months for an answer to appear in the magazine.

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Just how toxic are golf course chemicals?

Paul Sartoretto, Ph.D., W. A. Cleary Chemical Corporation

For the past fifteen years, I have been going around the country speaking at regional or monthly meetings of the Golf Course Superintendents on the subject of tank mixing pesticides with the emphasis on compatibility and avoiding phytotoxicity.

A relationship between human toxicity and phytotoxicity exists primarily because of the close similarity of the toughness of the epidermis of the grass blade and our outer skin. The skin of the grass blade has its stomates through which air and water pass in and out. Human skin has pores through which water diffuses.

In my talk, I make a general broad statement that all the insoluble pesticides can be tank mixed and sprayed and you will not incur phytotoxicity. The reason is obvious. Even though the insolubles have to be ground down to micron size in order to get them to disperse in water, the micron particles are too large to diffuse through the stomates.

They have to be thousands of times smaller, actually molecular in size and in solution to diffuse into the cells of the grass blade. The same principle applies to our outer skin. The insolubles cannot be absorbed through our pores because the particles are too large, and only the solubles that are molecular in size can diffuse through the skin.

Superintendents can take a certain amount of comfort in knowing that you work with a large number of insolubles and that they cannot penetrate our tough outer layer of skin. Epidermal toxicity with insolubles (wetable powders and flowables) is non-existent to a very high degree.

You can see how doubtful the claim was that a golfer died from dermal exposure to Daconil 2787, an insoluble, sprayed on the grass. No way could Daconil have diffused into his body.

It could be argued that Daconil vaporized and he breathed in a sufficient amount of it to poison him. But this mode of toxicity is doubtful with Daconil. In the same way a grass plant breathes through stomates and receives nutrition through the stomates and the roots, humans breathe through our lungs and receive nutrition through our mouths, and, then via the alimentary canal, by digestion into the blood stream.

We measure toxicity primarily by the minimum lethal dosage (MLD) neces-

TOXICITY OF PESTICIDES			
Expressed as Minimal Lethal Dosage necessary to kill 50 percent of the test animals by ingestion expressed in milligrams per kilogram body weight MLD ₅₀ mg/kg.			
INSECTICIDES		FUNGICIDES	
DASANIT	4	ACTIDIONE	2
NEMACUR	15	PMAS	40
OFTANOL	32	CADDY	88
MOCAP	62	BAYLETON	363
DURSBAN	135	CADMINATE	660
DIAZINON	300	THIRAM	780
PROXOL	450	BANNER	1517
SEVIN	500	KOBAN	2000
METHOXYLCHLOR	6000	RUBIGAN	2500
HERBICIDES		CHIPCO 26019	3500
PARAQUAT	150	DYRENE	5000
2,4DP	300	ALLIETTE	5800
2,4-D	375	FORE	7500
DSMA	600	FUNGO	7500
MSMA	700	BANOL	7860
BETASAN	770	DACONIL 2787	10,000
MCPP	930	TERSAN 1991	10,000
DICAMBA	1040	PCNB	15,000
PENDIMETHALIN	1250	3336	15,000
DACTHAL	3000		
BALAN	10,000		

sary to kill an animal by ingestion. Let us use aspirin as a bench mark to compare with our pesticides. It takes 1750 milligrams of aspirin for every kilogram of body weight to kill 50 percent of the animals ingesting it. The MLD₅₀ of aspirin is 1750—that's about six aspirin tablets. An adult weighing 50 kg (110 lbs.), by extrapolation, would die from 50 times the dosage or 300 aspirin tablets. In actuality, 10 times the dosage or 60 aspirin is fatal—17.5 grams, about 2/3 of an ounce. Reference is Merck Index.

But Daconil 2787 has an MLD₅₀ of 10,000 mg. That is six times safer than aspirin. That golfer would have had to ingest 100 grams or over three ounces of Daconil to have killed him. That's unlikely.

In my speech on how to avoid phytotoxicity, I generalize by saying insolubles cannot burn, but solubles can. You must exercise caution in their use.

We have been comparing an insoluble Daconil with a soluble aspirin. Aspirin is a safe soluble, but there are a number of solubles that you use that are not as safe as aspirin. Keep in mind the MLD₅₀ of aspirin as a bench mark.

You may have read recently about a fanatic that has been killing a lot of household pets in North Carolina by lacing pet food with the pesticide Disyston, an insecticide used by farmers. The MLD₅₀ of Disyston is about three mg. per kg. A cat or dog doesn't weigh

much more than three or five kg., so a lethal dose is not much more than 20 mg., the equivalent of a couple pinches of salt.

Disyston is a thiophosphate insecticide not much different than the thiophosphate insecticides you use, except yours are safer. Oftanol is 10 times safer with an MLD₅₀ of 32; Dursban is about 50 times safer with MLD₅₀ of 135; and Diazinon 5 is 100 times safer with MLD₅₀ of 300.

Nevertheless, these are low MLD₅₀'s and the concentrates are potentially dangerous. They act on insects and humans in the same way, poisoning the nervous system.

Ironically, granular Diazinon, which is the safest of the three, has been suspect for use on golf courses in some areas because of unfortunate misuse. They are usually formulated as emulsifiable concentrates, dissolved in an organic solvent, with an emulsifiable agent added. These, in turn, are to be mixed with large volumes of water sprayed on the golf course. It is further recommended that they be watered in to get to the grubs.

The same emulsifiable concentrate can be mixed with a granular carrier such as corn cobs or vermiculite so that they can be applied with a spreader. They, too, should be washed into the soil with large volumes of water.

If the corn cob is laced with Diazinon it becomes a tempting poisonous morsel for a bird. Birds weigh

continued on page 96

LANDSCAPE MANAGER OF THE YEAR

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1987 Landscape
Manager of the year
Michael Hugg

Entry forms are now being accepted by the Professional Grounds Management Society and Landscape Management magazine for their second annual "Landscape Manager of the Year" award.

Purpose of the award is to recognize superior job performance among landscape managers, to challenge those involved in the industry to achieve higher standards of excellence, and to bring national recognition to deserving managers.

Any person directly responsible for the professional maintenance of one or more landscapes is eligible to enter. Applicants will be judged according to job performance, honors and awards, procedures and philosophies, and contributions to the green industry. Applicants will be asked, at the time of entry, to submit four 5 x 7 black-and-white glossy photos and 10 color 35mm slides of current work areas with a short narrative on each.

CONTEST DEADLINE IS DEC. 31st, SO APPLY FOR OFFICIAL ENTRY FORM NOW!

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Applicant's name

Title

Applicant's company

Official entry form should be sent to:

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Mail to: PGMS, Landscape Manager of the Year, 1201 Galloway Ave., Suite 1E, Cockeysville, MD 21030