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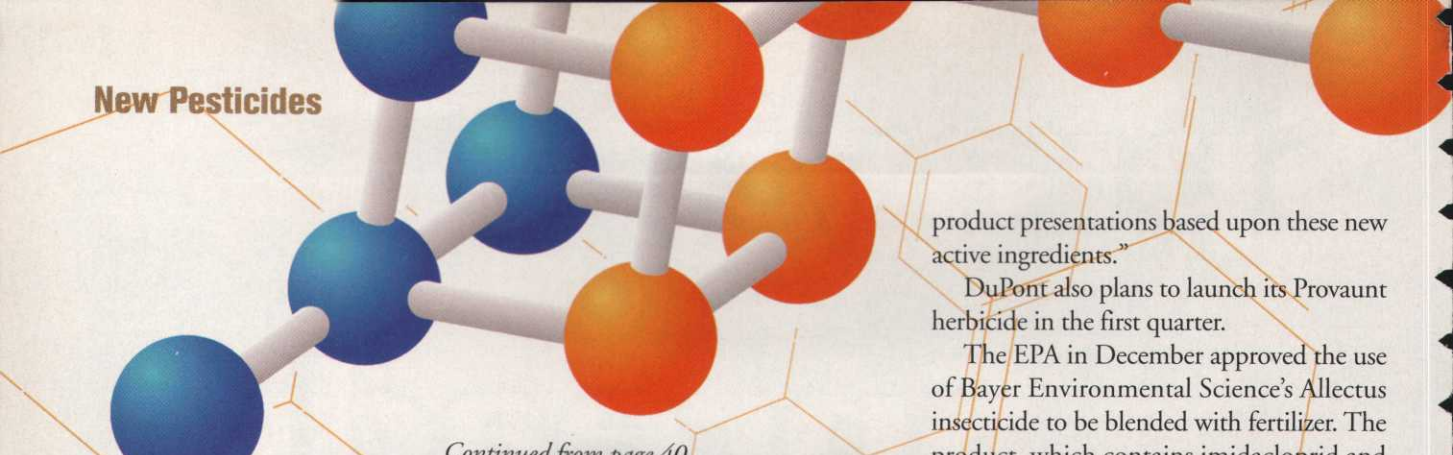

"(E2Y45) has a similar profile to indoxacarb ... with a different mode of action."

MIKE MCDERMOTT,
DUPONT GLOBAL
BUSINESS MANAGER

Continued from page 40

fgrasses, with demonstrated safety to most turfgrass species.

Turf professionals can be assured that SedgeHammer has the type of formulation, use rates, packaging, efficacy, and safety to both cool- and warm-season turfgrass that they have grown accustomed to with its predecessor, Manage Turf Herbicide," Kory Wheeler, Gowan's SedgeHammer Herbicide product manager, says.

Susan Carney, the communications manager with Dow AgroSciences, says superintendents are seeking products that can be tank-mixed, such as the company's Spotlight herbicide, which offers post-emergence control of broadleaf weeds and clover.

Insecticides

DuPont Professional Products is focusing on expanding the utility of its breakthrough active ingredient, indoxacarb, present in its granular fire ant bait, Advion.

"We have registration, we're just making some minor changes to the label to make it more flexible for golf courses and landscape ornamentals," Mike McDermott, DuPont's global business manager, says.

The company plans a second-quarter launch of Advion mole cricket bait. "We're developing a variety of roach and ant products for the professional pest control market," he says.

In addition, DuPont is readying two other insecticides for registration, including a new class of chemistry the company currently refers to as E2Y45.

"It has a similar profile to indoxacarb ... with a different mode of action," McDermott says. "It appears to be a very strong turf product, with excellent grub activity.

"We haven't had a lot of new products coming out this past decade. But over the next seven years, we will be launching four to five new active ingredients, never mind all the product presentations based upon these new active ingredients."

DuPont also plans to launch its Provaunt herbicide in the first quarter.

The EPA in December approved the use of Bayer Environmental Science's Allectus insecticide to be blended with fertilizer. The product, which contains imidacloprid and bifenthrin, follows in the path of previously registered Allectus G and Allectus SC.

Superintendents can now utilize fertilizer that has been impregnated with Allectus. Applied in combination with the fertilizer or as a granular or liquid, Allectus is effective above and below the surface. Some of the pests it controls include all major white grub species, billbug larvae, annual bluegrass weevil larvae, mole crickets, chinch bugs, cutworms, sod webworms and fire ants.

"We're excited about Allectus," Scott Welge, Bayer's business manager of fungicides, says. "It's the only product available that controls all major surface-feeding and subsurface insects."

At BASF, officials are anticipating a new fire ant bait that will be released in 2007. The yet-to-be named product will contain the active ingredient metaflumizone and will replace the company's Amdro Pro.

"Amdro Pro is a tried-and-true technology. It's been around a long time, and we're ready to freshen things up a bit," says Toni Bucci, BASF's turf and ornamental business manager. "We're bringing in a new proprietary BASF chemistry, one that was discovered in our labs, and we're proud of it."

Chemtura Crop Protection is developing a botanical nematicide for the suppression of turf and ornamental parasitic nematodes, including lance, sting and stubby root nematodes. The company expects federal registration in early 2006.

Bell Laboratories can boast of two new products that kill moles and other small animals. Rodent Rid controls outdoor pests, including moles, pocket gophers and ground squirrels. Its active ingredient, 2 percent zinc phosphide, is formulated with human food-grade ingredients for highly palatable bait that competes well with food in the animals' natural environment.

Continued on page 44

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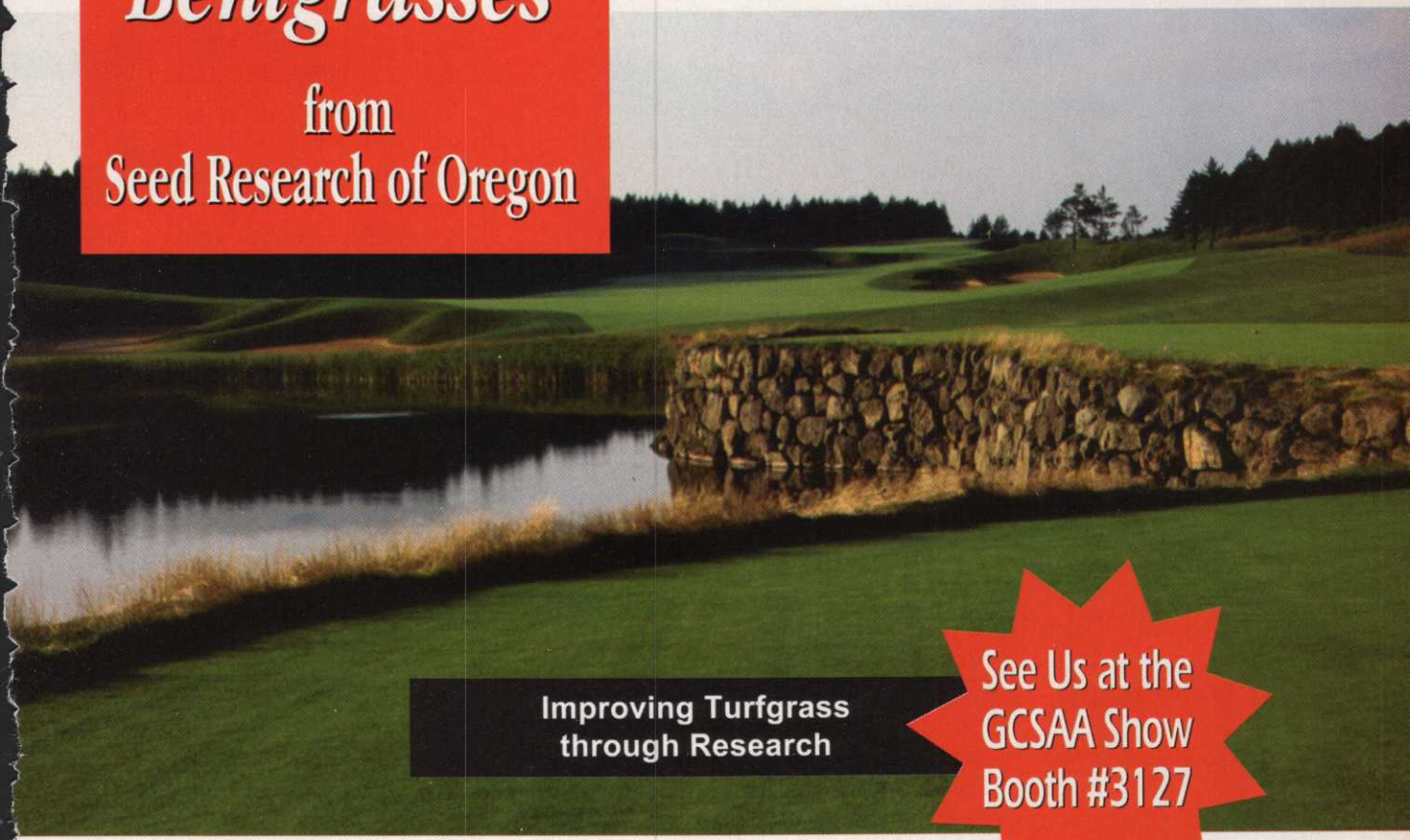

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Continued from page 42

Another Bell Labs product, Talpirid, is a mole bait. Its size, shape and feel encourage moles to consume the bait in the same manner as its primary food source, the earthworm. Once consumed, the active ingredient, bromethalin, capitalizes on the mole's unique physiology and kills the rodent in 24 hours.

Fungicides

Syngenta plans on launching a pair of fungicides that combine the best of pre-existing products.

Headway, which is targeted for almost all turf diseases, will suit everyone that had already been using Heritage or Banner. "Banner picks up dollar spot, which Heritage misses, and Heritage picks up pythium, which Banner misses, and they complement each other on many of the other diseases," says Dave Ross, Syngenta's turf and ornamentals technical manager. "It's not just a thrown-together formulation; it's a high-quality formulation. ... The two products enhance themselves when you put them together."

Instrata, a combination of three active ingredients, is indicated for snow mold. "There are about four different pathogens that cause snow mold across the northern tier," Ross says. "No single active gives complete control, and many superintendents are using tank mixes of several products. This is one single product to control all of those pathogens."

Pending EPA registration, Bayer plans to introduce this year what it calls a "unique" fungicide specifically developed for golf courses. Tartan addresses turf stress and the diseases common to fairways, greens, tees and rough areas, including dollar spot and brown patch.

Further into the future, Bayer is developing a fungicide that, Welge says, will provide "unsurpassed control" of anthracnose in cool-season turfgrass varieties.

Arysta LifeScience in January received federal registration for Disarm (fluoxastrobin), a material the company licensed from Bayer CropScience. "It's a strobilurin chemistry," says Tom Kroll, Arysta Lifescience's product manager of fungicides and turf and ornamental products.

The launch of Disarm will be limited this season to establish its performance on labeled diseases and to determine its activity on other species. "We will be confirming 2005 results that illustrate the material is effective on pythium," Kroll says.

Cleary Chemical is planning to pump up the marketing efforts of two recent launches, 3336 Plus and 26/36 Fungicide.

The addition of the active ingredient thiophanatemethyl is what separates 3336 Plus from its predecessor, 3336, according to Don Breeze, Cleary's director of new business. The product, he adds, is primarily positioned as a fairway fungicide.

In addition, the company's patented Cleartec Activation Technology allows 3336 Plus 50 percent longer control, says Rick Fletcher, Cleary's technical and regulatory manager.

"It is a method which really changes the way thiophanatemethyl interacts with the growth of the disease," Fletcher says. "What we find is that where we can put out 3336 by itself, and then put out 3336 Plus next to it, the testing we have done the last three to five years continues to show us the same output — up to 50 percent longer control when we use the Cleartec technology."

26/36 Fungicide, a combination of iprodione and phiophanatemethyl that Bayer and Cleary jointly produced, is predominantly focused on dollar spot and brown patch.

"We put these two together to enhance spectrum, especially in some areas where we may have dollar spot resistance," Fletcher says.

BASF plans on offering a new herbicide by 2008 and a new herbicide and fungicide — both featuring new chemistries — by 2010.

"I think what superintendents will see is that it will give them some additional resistance management tools and some more breadth of control for certain diseases and weeds," Bucci says.

All in all, superintendents have a pretty simple goal when it comes to pesticides, according to Steve Jedrzejek, Chemtura's commercial manager of specialty products.

"Peace of mind is very important," he says. ■

"No single active gives complete control (over snow mold), and many superintendents are using tank mixes of several products."

DAVE ROSS, SYNGENTA TURF AND ORNAMENTALS TECHNICAL MANAGER

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Putting the 'S' in Disease Control

BY KARL DANNEBERGER

Recent news has been filled with the possible Avian flu outbreak. The likelihood that tens of million of people worldwide could be infected is making many health and government officials nervous. The potential spread of this pandemic is in many ways beyond human grasp, while preparing for its onset is even more mind-boggling.

Although preparing for and effectively controlling turfgrass diseases does not rank on the same scale as flu pandemics — let alone having a disease control "budget" of more than $7 billion dollars — preparing for a disease outbreak is applicable to our field.

Focusing on a common disease of turf — dollar spot — recent research shows that preparing for potential summertime outbreaks may reduce its severity. Turfgrass pathologists and researchers at several universities, including Rutgers University, The Ohio State University and Purdue University, recently submitted a paper at the American Phytopathology Society Meetings entitled, "Impact of Fall and Spring Fungicide Applications on Dollar Spot." As the title implies, either a fall or spring fungicide application or both can reduce the amount of dollar spot the following spring and early summer.

The timing of these fungicide treatments is still being defined. However, given that dollar spot occurs on creeping bentgrass and *Poa annua* for most of the growing year, the cost savings from a late or early application may be significant in that fewer spring and early summertime applications are needed.

A second disease — anthracnose — occurs anytime *Poa annua* and/or creeping bentgrass is under stress. Similar to dollar spot, controlling anthracnose is especially difficult when treating it curatively. Superintendents in the northeast United States have practiced an early treatment strategy for anthracnose. A fungicide application is made in late fall to reduce disease infection and pathogen levels prior to the start of the next year.

The theory behind early treatment is based in a large part on how pathogen populations develop. Population growth occurs when "births" are greater than "deaths" (immigration is excluded in this explanation). No matter how small the difference, eventually the population will increase at an exponential rate until food or resources like space become limiting. Plotting population growth produces a sigmoid (S-shaped) curve or, as it is sometimes called, a growth curve.

FUNGICIDE APPLICATIONS MADE IN THE FALL AND EARLY SPRING TO CONTROL DISEASES ARE TARGETED TO KEEP THE PATHOGEN POPULATION LOW

Pathogen population growth begins slowly (the bottom part of the curve). However, as the population reaches a critical level, it increases rapidly. For example, if we took a hypothetical organism that doubled in size every 30 seconds, it might start off slowly doubling from two to four, then eight, 16, 32, 64, 128, etc. As this number increases rapidly, it reaches the exponential phase or the midsection of the S-shaped curve. If we were to extrapolate and say in this example that the middle part of the curve is the critical level for disease damage, it becomes obvious at what point our disease control practices are most effective.

If we target our control practices at the bottom, flat part of the S-shaped curve, our practices will suppress and slow the development of the pathogen, considerably taking longer to buildup to the unacceptable disease level. However, if we target our practices to the middle part of the S-shaped curve or the exponential phase, depressing or knocking down pathogen population levels becomes considerably more difficult.

Fungicide applications made in the fall and early spring to control diseases are targeted to keep the pathogen population low. Thus, the period required to reach epidemic proportions takes longer to build up during the growing season.

Continued research should help define the window of opportunity in the control of turfgrass diseases. Early prevention appears to be important not only in human health but also in turf health.

Karl Danneberger, Ph.D., Golfdom's science editor and a turfgrass professor from The Ohio State University, can be reached at danneberger.1@osu.edu.

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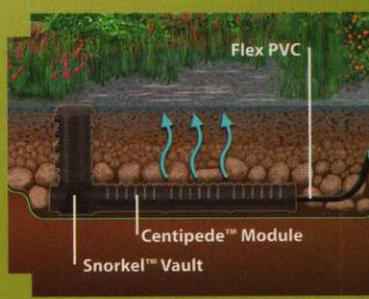

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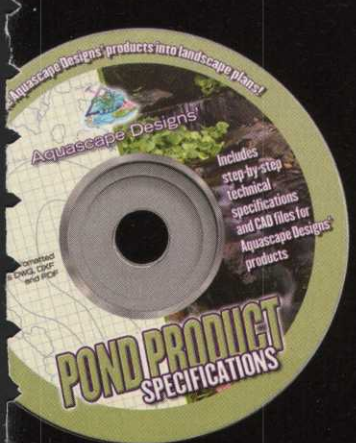

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PETA Leader Speaks Out

A player herself, wildlife biologist Stephanie Boyles lauds the golf industry to a degree while noting that superintendents could do a better job, especially when it comes to removing Canada geese

BY GEOFF SHACKELFORD, CONTRIBUTING EDITOR

Stephanie Boyles has been a wildlife biologist with People for the Ethical Treatment of Animals (PETA) for eight years. Although she's only been playing golf for two years, she's already broken 90. In this Q&A, Boyles clarifies what PETA (*www.helpingwildlife.com*) has to offer and suggests solutions to the elusive Canada Goose problem. She is based in PETA's Norfolk, Va., office and gladly accepts calls (757-622-7382) from those looking for more effective and humane ways to handle wildlife issues.

Can you talk about the 1998 wildlife damage control questionnaire that you sent to 15,000 golf course superintendents and what perspective you gained from it?

I asked superintendents what types of problems, if any, they encounter with wild animals, what methods they use to solve these problems, and how effective these methods were in reducing or eliminating damage. Thanks to those who completed the questionnaire, we discovered that superintendents deal with a variety of animals, including alligators, armadillos, bears, beavers, chipmunks, coots, coyotes, cranes, crows, deer, elk, foxes, gophers, ground squirrels, moles, moose, muskrats, opossums, prairie dogs, rabbits, raccoons, skunks, snakes, snapping turtles, squirrels and woodchucks among others. However, without a doubt, the animals that superintendents contend with more than all of the others combined are Canada geese. We also learned that there are four common methods used by superintendents to control Canada geese on golf courses: harassment with trained dog teams, addling eggs (contraception), controlled hunts and roundups.

In July, when Canada geese shed their feathers and grow new ones (a process known

TOP PHOTO BY: MIKE KLEMME; BOTTOM RIGHT PHOTO COURTESY: STEPHANIE BOYLES

Canada geese, while the bane of superintendents, have a friend in PETA wildlife biologist Stephanie Boyles (bottom right).

as molting), the birds temporarily lose the ability to fly. It's during this time of year, when the birds are vulnerable and have no way to flee from danger, that golf courses hire federal agents and/or wildlife-control operators to herd the geese into crates and either gas them or send them to processing plants to be slaughtered and butchered. Roundups cause immeasurable stress — separating lifetime mates from each other and from their young goslings. (Watch footage of USDA-Wildlife Services rounding up Canada geese at *www.petatv.com/tvpopup/Prefs.asp?video=canada_goose.*)

Besides being cruel, in most cases superintendents indicated that killing the geese did not solve the problem. That wasn't surprising. As long as the areas of concern remain attractive and accessible to these birds, more will simply move in from surrounding areas to fill the newly vacant niche, resulting in a perpetual, vicious roundup-and-kill cycle. In response, we sent superintendents information on ways to effectively and permanently keep geese away from fairways and greens through the development and implementation of integrated Canada goose management programs that include habitat-modification strategies, repellents, fencing, frightening devices, reproductive controls such as egg addling and public education programs (that discourage people from feeding the birds).

PETA has been "branded" as an extreme activist group by some. Yet anyone who looks beyond the rhetoric sees that PETA offers sound solutions to problems and considers all sides of an issue. What kind of response have you gotten from the golf industry?

When a PETA member sends me a news clip about a golf course that's planning to round up Canada geese, the first thing I do is call the superintendent. I tell him or her that I'm PETA's wildlife biologist, have developed wildlife control strategies for several golf courses and would like to offer my assistance in helping the course develop a program to solve the goose problem without killing the birds — free of charge. At first, superintendents are skeptical — not because I work for PETA but because in most cases they think they've already tried everything and doubt I have anything to bring to the table that they haven't already seen before. I sense their hesitation and disbelief — that's when I tell them about North Ridge Country Club in Raleigh, N.C.

In July 2001 the North Ridge Country Club was just days away from rounding up and killing more than 150 Canada geese that were living on the club's golf course. At the last minute North Ridge officials agreed to meet with representatives of the Society for the Prevention of Cruelty to Animals of Wake County, Geese-

Continued on page 50

Everything from pheasant to alligators to woodchucks inhabit golf courses.

PHOTO BY: GEOFF SHACKELFORD

Continued from page 49

peace (*www.geesepeace.org*) and PETA to discuss the possibility of implementing a program that would rid the golf course of waterfowl in two weeks without killing the birds. Thanks to our combined efforts, North Ridge was free of geese in less than two days without killing a single goose and has remained goose-free for the last four years.

At this point, most superintendents are relieved. They don't relish the idea of killing these animals. Their intentions aren't malicious. I mean, some superintendents may not be particularly fond of animals and may have no empathy for Canada geese whatsoever. However, in my experience, I have found that most superintendents are extremely fond of animals, especially wild animals, and given the choice between implementing an effective, humane, environmentally friendly and cost-beneficial program (like the Geesepeace program) and doing something as ineffective, cruel and controversial as rounding and killing these animals, they will choose the former rather than the latter. Not to mention, superintendents and groundskeepers feel an enormous sense of accomplishment when they are able to solve problems with these animals without having to kill them.

Golf still gets a bad rap environmentally, yet golf courses often serve as refugees for rare wildlife and most superintendents are sensitive to wildlife issues. In your view, how are golf courses doing from the perspective of wildlife preservation?

Golf courses do get a bad rap and most environmentalists agree that it's well-founded. A typical course uses astounding amounts of water — enough to supply a small town. They can generate more pollution from fertilizers and insecticides than a working farm. Golf courses take up as much acreage in the United States as Rhode Island and Delaware combined, with more courses opening each month.

Many people dwell on the negative impact that golf courses have on the environment, but I think it's also important to keep things in perspective. Golf courses are far more wildlife-friendly and bio-diverse than parking lots and strip malls, but that's hardly a fair comparison. Thankfully, a small but increasing number of courses aren't satisfied with the status quo either and are seeking eco-friendly certification from organizations like Audubon International, which requires that facilities undergo a multi-step process to improve water conservation, create wildlife habitat and reduce chemical use. Also, Arnold Palmer and other pros are promoting new, environmentally sound management practices and encouraging golf course architects to return to the origins of golf and create course designs that follow the natural shape of the land.

Problem is, the Audubon program is completely voluntary and though their standards are strict, the program is intended to educate superintendents, not regulate them. Some in the golf industry believe the only way to alter the negative public perception of golf courses is to establish minimum standards for construction, water usage, plants, wildlife habitat, fertilizers and pesticides to which facilities must adhere. The Environmental Institute for Golf is taking on this challenge and hopefully will pave the future of golf course management.

As a golfer yourself, what kind of things would you like to see the golf industry do in the future to enhance its image environmentally?

Whenever I learn about plans to develop a new golf course in my area, I'm often tempted to call the architect and say, "Remember: If you build it, they will come." The "they" I'm referring to isn't a group of famous phantom golfers but the Canada geese, ducks, rabbits, squirrels, foxes, raccoons, and other animals that will quickly make the new golf course their home. As stated previously, with the golf industry moving toward more wildlife and environmentally friendly designs, architects and superintendents must anticipate problems since these phenomenal courses are bound to attract animals other than the intended guests. When that happens (and it will), the golf industry must commit itself to co-existing with these animals that are merely responding to an invitation.

It's not enough to create wildlife habitat — we must be able to foresee potential problems and do all we can to co-exist peacefully with animals that take refuge on golf courses. For starters, prevention is better than a cure. It's more effective and cost-beneficial to use preventive techniques before animals become established. For example, with assistance from wildlife control experts, golf course architects can

Continued on page 52