**MAINTENANCE**

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**Wildlife studies complement one another**

Audubon investigating from the point of view of sustainable resources

By MARK LESLIE

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ELKIRK, N.Y. — In fortuitous timing for an industry seeking wisdom about golf’s environmental impact, the Audubon Society of New York (ASNY) is undertaking a wildlife study that dovetails with the U.S. Golf Association’s (USGA) Wildlife Links program overseen by the National Fish and Wildlife Foundation.

“This came about at a fortunate time because I was in the process of instituting the Audubon Center for Sustainable Resource Management (ACSRM),” said ASNY President Ron Dodson.

Wildlife Links and ACSRMI

Continued on page 22

The impact of golf courses on deer and other wildlife is the subject of more intense study.

**Experts urge aggressive defense vs. Lyme disease**

RESEARCH TRIANGLE PARK, N.C. — Despite more than a decade of public awareness, the number of reported Lyme disease cases remains high, and some experts are now recommending a more aggressive approach for controlling the ticks that carry this potentially debilitating disease.

Many medical health-care experts and university extension offices now urge homeowners in high-risk areas to treat their lawns and lawn peripheries with an insecticide to reduce populations of the ticks which vector this disease. The primary vector of Lyme disease is the deer tick, also known as the black-legged tick.

Although ticks are most commonly found in wooded, overgrown and weedy areas, many Lyme disease victims are bitten by ticks in their own yards, and the use of protective clothing and insect repellent alone have not been successful in checking the spread of the disease. In 1994, more than 10,000 new cases of Lyme disease were reported in the United States, according to the United States Centers For Disease Control (CDC). More than 250,000 cases of Lyme disease have been reported since recording of these cases first began (1982-1993).

In high-risk areas, such as the Northeast coastal states, North Central states and parts of the West Coast, an application of a commonly used home insecticide can help reduce deer tick nymphs and adults in home lawns and lawn peripheries by up to 95 percent.

Although symptoms are sometimes absent, Lyme disease is usually initially treated with antibiotics, if left untreated, the disease may result in double vision, chronic arthritis, meningitis, hearing loss, cardiac problems, memory loss.

Continued on page 21

**No Dutch treat for elm lovers**

By DAVID M. ROSE

GROSSE POINTE FARMS, Mich. — In the early part of this century, golfers teeing off here at the Country Club of Detroit enjoyed the shade and splendor of more than 3,000 stately American elms. Today, all but 300 are gone, victims of the deadly Dutch elm disease.

Although this disease is treatable with antibiotics, if left untreated, the disease may result in double vision, chronic arthritis, meningitis, hearing loss, cardiac problems, memory loss.

Continued on page 18
Tradition left behind in fight vs. elm disease

Continued from page 13

the chances that Dutch elm disease will gain a foothold are greatly reduced.
Not everyone agrees, however:
"We're getting away from the traditional concept of spraying for bark beetles," said Dr. Doug
glass Caldwell of Davy Tree Ex-

pect Co. Caldwell said the high
centrateions of insecticide pre-
scribed for large trees like elms pose potential exposure problems for workers, and could lead
to liability due to drift. What's
more, said Caldwell, elimination of bark beetles appears to be unnecessary as long as the fun-
gus is attacked directly with the application of trunk-injected fun-
gicides.
The most widely used fungici
de is Arbotect, manufactured by Merck. Another fungicide,
Lignasan, has been discontinued by DuPont, but its active ingre-
dent is now available from ERI under the name Elm Fungicide.
Both fungicides are applied via
macro-injection, whereby a large hole is drilled in the base of the
tree, a tank is fastened with a
harness, and dilute fungicide is fed into the tree either by grav-
ity or by low-pressure injection.
Alamo, a newer fungicide from
Ciba Turf and Ornamental Prod-
ucts, is available in both macro-
and micro-injection formulations.
The new micro-injection system
consists of individual, self-con-
tained units that are inserted in
small holes drilled in a tree's
flare roots.
After a light tap from a ham-
er, the units are pressurized and the fungicide (about 10 mil-
liters compared to the 10 gal-
lons used in macro systems) is
jected into the tree.
Once applied, "You can basi-
cally walk away from it," said Dr.
Doug Houseworth, manager of
technical support at Ciba,
"whereas with the macro system
you've got to baby-sit it." Com-
pany officials estimate the mi-
cro-injection units save six to
eight hours of labor per tree over macro-injection methods.
All three fungicides are most

effective when used as a preven-
tive treatment.
In nationwide tests on more
than 8,000 healthy trees treated
with Elm Fungicide, according to
ERI, less than two percent were
lost to Dutch elm disease.
Studies on Alamo conducted by
Dr. R. Jay Stipes of Virginia Poly-
technic Institute yielded similar
results.
The fungicides can also be
used to treat infected trees, pro-
vided the disease is caught early,
typically when trees show 20
percent or less crown symptoms.
Under these circumstances, ERI
reports a success rate of 84 per-
cent for Elm Fungicide.

Scientists attempting to improve friendly virus

New fungicides and resistant elm cultivars
may make their job easier, but when it comes
down to it, arborists are still fighting the
battle against Dutch elm disease the old-fash-
ioned way: one tree at a time.
Is there any hope for a tactical strike that
would wipe out Dutch elm disease altogether?
A cursory survey of the scientific literature
reveals a possible answer in the December
1993 issue of the British magazine Geogra-
phical. It reported that scientists have isolated a
naturally occurring virus that infects the Dutch
elm fungus and significantly reduces its poten-
tial to cause disease. Efforts are underway to
tinker with the virus, making it more effective.
The ultimate goal is to release a fortified virus
into the wild where, theoretically, it would spread
quickly, taming the once-deadly fungus. This is
an exciting prospect, but don't expect to see the
virus on the shelf at the local garden center any
time soon. While the concept is certainly intrigu-
ing and appears technologically feasible, much
work remains to be done.

In addition, any modified virus is certain to
face formidable regulatory hurdles, since fed-
eral regulations are notoriously — and, per-
haps, appropriately — strict in cases involving
generic engineering.

— David M. Rose

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Alonzi testifies: Tissue analysis saves turf and money

By PETER BLAIS
MAMARONECK, N.Y. — The 6th East green at Winged Foot was supposed to be a showpiece.
Over the years, the front of the putting surface had settled, creating a severe slope. Tom Fazio was called in to restore the green, reducing the grade and creating more pin placements.

But shortly after Fazio departed, problems arose. The front section of the green, which had required 15 inches of new soil in some places, started to wilt and go under stress more easily than other greens.

Superintendent Robert Alonzi thought the 6th was probably percolating faster than his other putting surfaces and needed more water and fertilizer. He blamed it on the additional soil. But coincidentally, shortly after completing the restoration, Alonzi started using tissue analysis, The Karsten Turf Analyzer showed the restored green to be very low in potassium and iron. Alonzi increased the feedings of these materials and the green quickly returned to normal, raveling the condition of any other putting surface at the famed Long Island club.

The $28,000 Turf Analyzer is about the size of a small personal computer and interfaces with IBM-compatible PCs. Grass clippings are collected, washed, dried in a microwave and ground in a blender before being placed in the analyzer. Using near-infrared reflectance technology, it measures the levels of 11 elements essential to turfgrass growth. The whole process takes about 20 minutes.

Alonzi performs tissue analysis on specific areas on an every-other-week basis — greens and tees one week, fairways the next. Over the past two years, he has developed a baseline that helps him decide whether to increase or decrease fertilizer and other treatments.

"It’s another tool for the superintendent," Alonzi said. "It doesn’t tell you to go out and feed the grass this material or that material. It gives you a reference point from which to work."

Alonzi said the analyzer has allowed him to reduce overall pesticide use while providing information that allows him to effectively adjust fertilizer applications to materials with needed micronutrient levels.

"In the long term, it’s worth the cost," said Alonzi. "We spend that much on a single piece of maintenance equipment. If a club couldn’t afford it then it might be worth contacting a lab with an analyzer that could perform the test for a fee two or three times a month."

Karsten Turf General Manager Ernest "Buck" Menendez said roughly 30 courses have purchased the unit since it was first introduced in 1981. Many of those have been 36-hole facilities or management companies that can share the equipment among several courses.

"It’s an expensive piece of equipment," Menendez conceded. "But fertility management is a concept that’s gaining steam. If it helps superintendents maintain their turf through stress periods, then it’s a good investment."

Elm disease battle
Continued from previous page

recommended dosage but still sees no toxicity.

As effective as fungicide treatment appears to be, it is only a partial solution. The residual period for fungicide treatment is typically one to two years, and constant vigilance is required to protect existing elms.

Another approach that may provide more lasting relief from the ravages of Dutch elm disease is the development of disease-resistant varieties of American elm. To this end, ERI has developed the American Liberty elm.

Working in conjunction with the Boy Scouts of America, ERI has undertaken an aggressive distribution program to place the disease-resistant elm in communities throughout the United States. So far, the tree’s resistance to Dutch elm disease is impressive: Of more than 250,000 trees planted in the United States and Canada, only 14 cases of Dutch elm disease have been reported.

Carey Mitchelson, superintendent at the Country Club of Hudson (Ohio), has planted some 50 elms as part of ERI’s Liberty Tree Memorial Program. "They’re upright and they have a vase shape, so you can put them fairly close to a hazard, giving a graceful appearance without detracting from the hole," said Mitchelson. "Architecturally, the elm tree is probably one of the most graceful trees you can put on a golf course."