A littleleaf linden tree in mid-summer completely defoliated by adult Japanese beetles. Notice the typical top-down feeding pattern common to trees defoliated by Japanese beetles.

**continued from page 79**

Varieties with larger blooms are also more appealing to the beetle. In experiments with red or yellow flowering rose bushes, Japanese beetles will land on the yellow flowering ones, sometimes ignoring even the most fragrant red varieties.

**Biorational insecticides**

Adult beetles are commonly managed with applications of short-residual insecticides, like carbaryl or synthetic pyrethroids. There has been increased interest in the use of other biorational insecticides, including various formulations of neem-based feeding deterrents. In laboratory tests, these products effectively reduce the amount of feeding. In field tests when beetle infestations are heavy, even repeated applications aren’t sufficient to prevent damage.

Regardless of the control product, once a plant becomes damaged it can serve as a beacon to other beetles, attracting them with odors produced by the damaged leaves. Therefore, preventing feeding damage early and keeping plants undamaged as long as possible reduces the attraction of more beetles to those plants.

---

— The author is with the University of Kentucky Entomology Department, Lexington, KY. Contact him at dwheld@uky.edu.
When a customer called Jeff Hazlett and complained that her family couldn't use the front door due to swarms of bees and flies, he had his suspicions about what was attracting the insects. He inspected the customer's landscape plantings and confirmed that scales had infested three 9-ft. tall star magnolias in her front yard.

"Honeydew produced by the scale insects was dripping on twigs and stems near the front door, and insects were feeding on it," says Hazlett, owner of Ever Green Tree & Lawn Care in Lancaster, PA. "Sooty mold had formed over the honeydew, and whole branches had turned black. It wasn't a pretty sight."

**Sure signs of scale**
The presence of honeydew is a telltale sign of scale infestation. Honeydew is a sugary, liquid waste product that covers surrounding areas. This sticky, sweet liquid serves as a growth medium for sooty mold, a black fungus that eventually covers honeydew-laden areas. Another indication of scale is a greater-than-usual number of nuisance insects such as ants, bees, flies, hornets and yellow jackets, which are all attracted to honeydew.

In severe cases of scale infestation, foliage and fruit turn black from sooty mold and drop prematurely. In large enough numbers, scales remove enough sap from plants to starve limbs, branches and leaves.

For his customer with scale-infested magnolia trees, Hazlett soil applied Merit Insecticide in early spring, and followed it with a treatment of dormant oil. Later in spring, he made a foliar application of Merit mixed with a contact insecticide, ensuring that coverage was complete. The problem vanished by mid July.

"The customer was really impressed that the combination controlled scale so quickly," Hazlett says. "I attribute the successful treatment to the systemic properties of Merit combined with the dormant oil spray."

**Preaching IPM**
With three full-time employees, Hazlett provides landscape maintenance for primarily residential customers in Lancaster County. Though he's been in business for 15 years, he keeps his operation small, offering customized services such as fertilizing, spraying and mulching. He regularly monitors plantings, explaining to his customers the benefits of an integrated pest management (IPM) system.

In spring 2002, after two relatively mild winters in eastern Pennsylvania, an outbreak of cottony camellia scale on yews and hollies erupted in Hazlett's area. "Cottony camellia is a soft scale," he says. "If customers have a lot of evergreens and hollies, I'll make a preventive treatment of Merit for scale."

In addition to applying insecticides and dormant oils, Hazlett often prunes out damaged branches and foliage, and fertil-
izes beds or trees to restore vitality. Because pachysandra is easily affected by scale, he often applies dormant oil in spring to prevent infestations. LM

— The author is a freelance writer and frequently writes about the Green Industry from her home in Horsham, PA.

Two scales, two treatments

Not all scale species ingest sap and produce honeydew. Two general types of scales commonly appear on U.S. ornamental trees and shrubs: soft scale and armored scale. Learn to identify the two since control strategies are different for armored (hard) and soft scale.

Soft scale characteristics:
- Bodies are exposed and immature stages are "soft"; mature adult females have a hardened shell to protect the young
- Females are oval-shaped and usually conspicuous — about 1/10-in. long
- One generation per year
- Produce honeydew, attracting nuisance insects
- Overwinter as immature females
- Relatively prolific, producing more than 600 eggs at a time

Soft scales damage plants and make them unsightly by sapping juices, making sooty mold grow on honeydew. This substance is difficult to remove from parked cars, houses, porches and sidewalks.

Armored scale characteristics:
- Produce detached wax shell or "armor" over their bodies
- Females are usually elongated or circular and about 1/10-in. long
- Don't produce honeydew
- Two or more generations per year
- Overwinter as eggs, immatures or adults
- Produce fewer than 50 eggs at a time

Armored scales also damage plants by inserting long, straw-like mouthparts into plant tissue. Damage may appear as chlorotic areas of the leaves or yellowing of entire leaves or needles, resulting in leaf drop or dieback.

Walk the Hill with the Convertible mower. For steep hills, roadside ditches and low limb trees. The Convertible can be utilized as a hydro walk behind. Then as easy as flipping a lever, the Convertible transforms into a rugged dependable "I" so you can Ride the Distance!

Distributors:

New England States  Beta Power Products  508-393-1924
PA-NJ-DE  Canis Bilco  800-811-0285
VA-WV-MD-NC  UTECO  888-368-8326
TX-OK-  Kretchmar  580-395-2606
NY  Stiefvater Distributor  315-853-5581
KS-MO-  AES  800-843-3546
GA-SC-AL-FL  Southeast Equipment  800-241-4384
TN  Southern Lawn  877-204-6873
VA  Scott-Hourigan Co.  402-362-7711

Distributor inquiries welcome for open areas.

Rich Mfg., Inc. • P.O. Box 145 • Thorntown, Indiana 46071
www.convertiblemower.com • 765-436-2744

Circle 139
Zero-turn tech zipping along

BY CURT HARLER

The zero-turn industry is growing and evolving the same way minivans have changed since their introduction years ago by Chrysler.

While many manufacturers changed both the look and role of minivans, look for zero-turns to change in the areas of maintenance and operator comfort.

"While the base platform of zeros continues to evolve, most of the changes will boil down to serviceability and maintenance," says John Cloutier, Product Manager for Exmark of Beatrice, NB (www.exmark.com). He notes that landscape professionals, like car owners, prefer to turn a key and go rather than deal with upkeep. "Commercial mid-mounts are the same," he remarks.

Serviceability is a given. After all, landscape pros make money running their mowers, not working on them in a shop. "People don’t want so many service points. They want fewer places to grease," Cloutier says. As a result, manufacturers are designing out high maintenance components. Examples include sealed bearings and spindle assemblies that don’t require periodic greasing.

Room for improvement
Blade maintenance and air filtering are other areas ripe for improvement. Many blade manufacturers are looking at technology to extend blade life and to increase the time interval between sharpenings, Cloutier says, but most of them have yet to show the investment-to-value return that many professionals desire.

Air filters are another story. The industry is moving to a canister air filter fitted vertically above the engine. What used to be an option is now standard for many zero-turns. "They’re more expensive," Cloutier says, "but they lengthen change intervals and even provide a slight horsepower boost."

Operator comfort is the other area where zero-turns are improving. With workers in the driver’s seat 10 hours a day, many mower companies are looking for ways to add comfort with such items as seats or operator controls. Landscape pros are also interested in convenience items such as deck lifts.

Kubota’s ZD Pro Series mowers feature 54-, 60- and 72-in. decks.

4 key areas of performance
There are four key areas of mower performance, according to Harold Redman, vice president of product management for Simplicity (www.simplicitymfg.com, Port Washington, WI):

- cutting ability
- ease of use
- traction
- reliability

While some landscapers buy zero-turns on the basis of horsepower, it should not be the bottom line of a purchase decision. "Purchase a product based on its ability to provide lasting performance, not just on its horsepower or price," Redman says.

KUBOTA
888/458-2682
TORRANCE, CA
www.kubota.com

- New ZD-28F is largest in ZD Series
- Powered by a liquid-cooled, 3-cylinder E-TVCS diesel engine

continued on page 86
Presenting the new Snapper Z. Powerful, dependable, durable, with impressive features at every turn, the Snapper Z puts you in total control. This mid-mount commercial rider is equipped with a rugged, 7-gauge welded steel deck and solid steel deck stabilizer bars. You can power up with either the 19-HP or 21-HP Kawasaki V-Twin OHV engines and offer a great cut with 48" or 52" mowers. You'll tackle any size mowing challenge quickly and comfortably. As easy as it handles each new job, you'll find the Z just as easy to maintain. So make your own mark on the landscape with the new Snapper Zero Turn.
continued from page 84

- Cut 60- or 72-in.-wide with three blades
  Circle #272

**CUBCADET**
877/835-7841
CLEVELAND, OH
www.cubcommercial.com

- M60 Tank series mid-mount zero-turn
- Choose 25-hp Kohler Command or 23-hp Kawasaki V-Twin OHV engine
- 60-in. Command Cut System deck
- Marbane blades give 1.7-in. overlap (50% more than competition)
- Dual 5-gal. fuel tanks
  Circle #273

**ENCORE**
800/228-4255
BEATRICE, NB
www.encoreequipment.com

- Prowler comes in 52-, 61- and 72-in. widths
- New 25-hp Kawasaki air-cooled engine or 27 to 31 hp in gas and diesel
- 5.5-in. cutting height
- Mows at 10 mph
  Circle #274

**THE GRASSHOPPER CO.**
316/345-8621
MOUNDRIDGE, KS

- www.grasshoppermower.com
- True ZeroTurn power units offer horizontal crankshaft OHV engines
- 14 to 28 hp, liquid- or air-cooled
- Gas, dual fuel LP/gas, or diesel
- Mow at 10.5 mph
- 52- , 61- or 72-in. decks
  Circle #275

**HOWARD PRICE TURF EQUIPMENT**
636/532-7000
CHESTERFIELD, MO

- New Blazer 360Z-80 features 80-in. cut
- Mows 6.46 acres at 8 mph
- Flotation for dips, knolls with wing operation to 20 degrees
- 25-hp Kawasaki engine or 24-hp Honda
  Circle #276

**JOHN DEERE**
800/537-8233
RESEARCH TRIANGLE PARK, NC
www.deere.com

- 797 Z-Trak is newest zero mowcr from Deere
- Handles 60- or 72-in. side-discharge deck
- 29-hp, liquid-cooled Kawasaki engine
- Mowing speeds to 11 mph
- Cut height from 1.5 to 5 in. in 1/4 in. increments
  Circle #277

**DIXON INDUSTRIES**
800/264-6075
COFFEYVILLE, KS
www.dixon-ztr.com

- ZTR-8000 series commercial ZTR mower
- 25-hp Kohler Command or 26.5-hp Daishatsu diesel engine
- 60- or 72-in. cut widths
- Attachments easily mount to mower with automotive-type receiver hitch
  Circle #278

**BOB-CAT**
414/637-6711
RACINE, WI
www.ransomes.com

- Bob-Cat ZT-200 Series features 20-hp Yanmar diesel
- Also comes with 19-hp or 23-hp Kawasaki V-Twin engine or 25-hp Kohler Command
- Lever-type steering
- Independent power to each wheel
- Mowing speeds to 8 mph
  Circle #279

**LESCO**
800/321-5325
CLEVELAND, OH
www.lesco.com

- Viper is mid-mount zero radius turn
- 48-in. deck standard; 54-, 60-in. available
- Cut height from 1.5 to 5.5 in.
- Powered by a 19-hp Kawasaki twin-cylinder OHV
  Circle #280

**HUSQVARNA**
704/597-5000
CHARLOTTE, NC
www.husqvarna.com

- Intermediate ZTH offers small, compact frame
- Cut heights from 1.5 to 5 in., 1/4-in. increments
- 11.4-gal. fuel capacity (in two 5.7-gal. tanks)
- 18-, 21- or 28-hp Kawasaki V-Twin engines
  Circle #281

**WALKER MOWERS**
970/221-5614
FORT COLLINS, CO

- The MTEFI line now available in a liquid-cooled package
- MTLEFI29 combines fuel injection with liquid cooling
- Kohler’s 29-hp fuel-injected Aegis engine
- Available in spring 2003
  Circle #282

**JACOBSEN**
866/522-6273
CHARLOTTE, NC
www.jacobsen.com

- JZT-2000 Series
- Choose 52- or 61-in. deck
  continued on page 88
Install Confidence: Install Rain Bird® 1800™ Spray Heads now with Top Color-coded™ nozzles.

Rain Bird U-Series and MPR Spray Head nozzles are now color-coded on the top to enhance your productivity.

- Quickly identify radius and arc with Top Color-coded nozzles.
- Top Color-coding makes it easy to verify proper nozzle installation, even when system is not operating.

Now it's easier to sort, easier to organize, and easier to install with Top Color-coded nozzles, now distinctly Rain Bird. Install Confidence. Install Rain Bird.

Sort quicker, install faster, check easier.

Rain Bird®

www.rainbird.com

Circle No. 122
continued from page 86

- Models with 19-, 23- or 25-hp Kawasaki
- JZT-2230-LC has 23-hp Kohler liquid cooled engine
Circle #283

FERRIS INDUSTRIES
800/933-6175
MUNNSVILLE, NY
www.ferrisindustries.com

- IS 1000Z model features two-wheel front IS independent suspension
- IS1000Z, 1000Z both have 21-hp Kawasaki engine for 48-in. deck

EXMARK
402/223-4010
BEATRICE, NB
www.exmark.com

- LazerZ available with 27-hp liquid-cooled Kohler
- 60- or 72-in. UltraCut deck options
- Cuts six acres per hour
Circle #284

YAZOO/KEES
877/368-8873
BEATRICE, NB
info@yazoookees.com

- Max 2 is large frame, mid-mount zero
- Seven engine options from 23 to 27 hp
- 52-, 61-, and 72-in. cutting widths
- Quick-lift deck adjustment cuts from 1.5 to 6 in.
Circle #285

GRAZER-INGERSOLL
920/582-5000
WINNECONNE, WI

- Front-cut zero-turn mowers available in 18 to 22 hp

Circle #288

- 52-, 62- and 72-in. side-discharge decks
- Decks float with tilt-back for easy service
- Add a grass collector, snow blower, cab or ROPS

Circle #287

SNAPPER
888/762-7737
MCDONOUGH, GA
www.snappper.com

- New for 2003 are two Z-Force mid-mount zeros
- 19-hp Kawasaki OHV V-twin with 48-in. deck
- 21-hp Kawasaki OHV V-twin with 52-in. mower
- Two 6-gal. fuel tanks
Circle #286

HUSTLER
800/395-4757
HESSTON, KS
www.exchullstler.com

- Z-rider features 60-in. deck
- 23-hp Kawasaki engine
- Low center of gravity: seat height is just 29 in.

Circle #289

THE TORO COMPANY
612/888-8801
BLOOMINGTON, MN
www.toro.com

- Mid-mount ZZ87L has liquid-cooled 27-hp Kawasaki
- 62- or 72-in. mowing deck
- Z-Stand Lift raises deck without additional tools
Circle #288

SWISHER
800/222-8183
WARRENSBURG, MO
www.swisherinc.com

- ZT17542 42-in. cut zero turn radius mower has three blades
- 17.5-hp Intek Briggs & Stratton engine

Circle #287

- 23-hp Kawasaki engine with 52-in. deck
- Also available in a 23-hp 100Z with 61-in. deck
Circle #289
What's Green, Big and Moves Every Year?

It’s the Green Industry Expo, where everybody comes to see what’s new in the green industry. This year, GIE moves to St. Louis, Missouri, at the Cervantes Convention Center at America’s Center from November 5 – 8, 2003.

This Expo is like none other, featuring more than 60 educational conference topics, 350-plus exhibitors launching new products, hands-on action with demonstrations at our Product Field Day, and the networking opportunity of a lifetime attended by over 6,000 industry professionals.

FREE attendee registration for the GIE trade show is available at www.gieonline.com, where you can also find convention details. For more information, visit our Web site, call 888-303-3685 or email us at info@gieonline.com.

If you’d like to receive the GIE/2003 brochure, please fill out the information below, clip and send it to GREEN INDUSTRY EXPO, 1000 Johnson Ferry Road, NE, Suite C-135, Marietta, GA 30068-2112, fax this to (770) 579-3835 or visit us at www.gieonline.com.

SEND ME INFORMATION ON ATTENDING THE TRADE SHOW & CONFERENCE.
SEND ME INFORMATION ON EXHIBITING MY PRODUCTS.

NAME: ________________________________
COMPANY: ____________________________
ADDRESS: ____________________________
CITY/STATE/ZIP: _______________________
PHONE: __________________ FAX: ________
EMAIL: ________________________________

GIE AND ITS EXHIBITORS MAY USE YOUR CONTACT DATA TO FORWARD YOU SHOW UPDATES AND PRODUCT INFORMATION. CHECK HERE [] IF YOU WISH TO HAVE YOUR INFORMATION WITHHELD.

GIE is sponsored and endorsed by:

Associated Landscape Contractors of America
(800) 395-2322
www.alca.org

Professional Lawn Care Association of America
(800) 458-3466
www.plcaa.org

Professional Grounds Management Society
(800) 609-7467
www.pgms.org
Oak infestation

A number of oak trees in the San Francisco Bay area are infested with an insect. The caterpillars feed and cause extensive damage. When they’re small, they feed on one surface of the leaf. As the larvae become larger, they feed through the leaves and can remove the leaves. We see the adults around May and again around October. What are they, and how do we get rid of them?

— CA

From your description, the problem is most likely related to the California oakworm (or oak moth), phryganidia californica. It’s considered to be one of the major insects affecting oaks in your state.

These insects are cyclic, which means in some years they may be very active and in other years their population may not be high. Extensive outbreaks and feeding can cause defoliation, affecting the tree’s shade and aesthetic benefits.

In your area, you may get two generations of the insect. It may overwinter as an egg or young larvae. As the temperatures increase in spring, the larvae mature and start feeding as you described. First, they tend to feed on one side. Then, as the larvae mature, they feed through the leaves.

They pupate on leaves, branches or trunks of oaks and/or other trees or objects nearby. Adult moths emerge from May through July and fly at dusk time. Then, they repeat the cycle and produce second generations of adults, which emerge in October or November. These adults produce eggs on leaves, branches and trunks. Deciduous oaks may get less infestations than evergreen oaks in the spring because eggs produced on leaves in late summer or early fall will be shed along with the leaves, which can be raked or blown away.

To manage the California oak moth, consider treating with insecticides such as bacillus thuringensis (Bt), Sevin, or Orthene. Bt is a biological control bacterial agent. This treatment works better on younger stages of the insect larvae. Also, it may help to rake and dispose of infested leaves.

Hit-and-run

A customer of ours has a young Chinese red maple tree that was run over by a station wagon and stripped of bark from the base of the trunk to the top of the tree. What can be done to save this little five-foot tree?

— CT

Depending upon how much bark has been stripped and damaged, the tree may survive the winter and produce normal growth next spring. Injury resulting from mechanical damage often doesn’t become obvious until moisture and heat stress occurs in the summer and the tree shows scorching symptoms and starts to decline.

In the meantime, consider removing all the loose bark by using the bark tracing technique — without harming the unjured, intact areas. Go around the injured bark with a sharp knife, trying to take only the loose bark. Also, provide proper watering, mulching and fertilizing as needed. Because of the injury, the tree is now stressed and susceptible to pest problems such as borer insects and canker diseases, so provide management as needed.

Dursban alternatives

We’re in the process of reviewing our insect control program for landscape pest management. In the past, we’ve used Dursban for a number of pests on trees and shrubs. Now, because Dursban won’t be available and/or we can’t use it anymore, we need to find alternative products. What can we use in its place?

— IL

As far as Dursban use, it’s my understanding that you can still use it until your supply is depleted if you have the product and label in your inventory. To confirm this, check with your Dow AgroSciences representative or account manager. However, if your clients are aware of Dursban’s removal, they may object to using it on their property.

As an alternative, consider using an insecticide such as Merit (imidacloprid), a systemic insecticide from Bayer. You can apply this in fall to get the benefit of systemic action and managing pests the following spring. It should be good for beetles, borers, leafminers and sawflies, Japanese beetles, etc.

Another group of new chemicals is called pyrethroids (Astro, Talstar, Delta-gard, Scimitar and Tempo). Read and follow label guidelines for specific rates and specific insect control. Also become familiar with their safety issues. Some of them may have concerns regarding throat, skin or eye irritation. These pyrethroid products are slowly replacing the traditional insecticides of the past for landscape pest management.

Manager of Research and Technical Development for the Davey Tree Expert Co., Kent, Ohio

SEND YOUR QUESTIONS TO: “Ask the Expert” Landscape Management; 7500 Old Oak Blvd.: Cleveland, OH 44130, or e-mail: rhall@advanstar.com. Please allow two to three months for an answer to appear.