



**Nursery**  
MANAGEMENT

# Tree & production harvest

See tree sales projections for 2012 and innovative processes your colleagues have adopted.





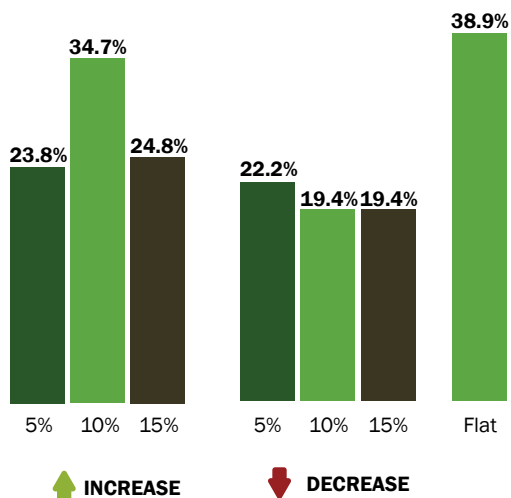
# Looking UP

There is a bit of good news to share regarding the tree market. *Nursery Management* surveyed tree growers nationwide and almost 35 percent expect revenue from tree sales to increase 10 percent this year over 2011. But it's still a slow turnaround – nearly 40 percent of respondents expect tree sales to be flat this year. However, sales increases of 5 and 15 percent outweighed sales decreases.

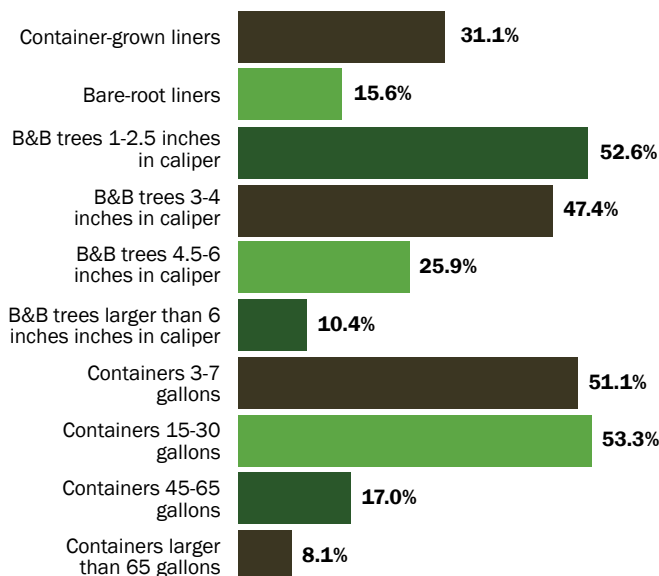
Those surveyed thought deciduous shade trees would see the most growth (40.5 percent). And it was no surprise that large material wasn't moving – only 8 percent of those surveyed were selling container trees larger than 65 gallons and B&B trees larger than 6-inch caliper.

Trees in 15- to 30-gallon containers were the top sellers (53 percent), followed closely by B&B trees 1- to 2 ½-inches in caliper. Growers across the country are reporting a shortage of 2-inch trees.

## Is your expected tree sales revenue up or down from 2011?



# In what ways will you sell trees in 2012?



## DEER PROTECTION

When it comes to deer, good aim is not always the best solution. Van Putte Gardens in Rochester, N.Y., uses Shake-Away powder and 90-day bags to get rid of deer. Todd Eging, nursery manager, said a weekly application of the powder keeps the deer out.

And Lancaster Farms in Suffolk, Va., fills small cloth bags with Milorganite and ties them to branches surrounding the nursery. Milorganite is a fertilizer and is not labeled as a deer repellent. But research at the University of Georgia and Berry College in Mt. Berry, Ga., found it repelled deer for up to 35 days.



## What market will see the most growth in the next three years?



19.8%

Evergreen Shade trees



26.7%

Flowering trees



40.5%

Deciduous shade trees



13.0%

Patio trees



## GROWER SPOTLIGHT

**Bergman Nurseries** in Quincy, Ill., had trouble getting water at one of its farms. The short-term solution was a two-person water wagon. Armed with an 1,100-gallon water tank, the water wagon is pulled by a tractor with a creeper gear. The tank sets on a trailer with flotation tires. The tank is equipped with spray bars made of 1½-inch PVC. The bars extend a few inches past the tractor tires. Small holes are drilled into the bars about 6 inches apart. The wagon uses a PTO pump to pressurize the PVC pipe. An in-line filter helps to reduce clogging. Two workers can apply 7,000 gallons per day with this system.

### about >>

Bergman Nurseries operates a wholesale and landscape division, as well as a garden center.

### for more >>

[www.bergmannurseries.com](http://www.bergmannurseries.com)



## GROWER SPOTLIGHT

**Hinsdale Nurseries** in Willowbrook, Ill., created a clever solution to keep its balled and burlapped trees upright. This rebar stand was fabricated by an employee.

### about >>

Hinsdale grows trees, ornamentals, evergreens, shrubs, perennials and annuals. The company operates wholesale, retail and landscape divisions.

### for more >>

[www.hinsdalenurseries.com](http://www.hinsdalenurseries.com)





**TOP:** A combination of handheld scanners and custom software help Herman Losely & Son track inventory from sticking to shipping.  
**BOTTOM:** The software package has increased efficiency by 30 percent in order fulfillment.

# High-tech help

Scanners and software help Herman Losely & Son track inventory

**H**erman Losely & Son, a one-thousand acre nursery in Ohio, has implemented a rugged mobile handheld computer to replace a manual paper system for tracking inventory and shipments. The nursery went from the paper system, to a barcode tagging system, and finally, a handheld computer system.

“Like everybody, we used to handle our inventory on paper,” said Karl Losely, company president.

Losely and his wife spent many nights at the dining room table checking items that had been tagged for sales and shipping.

“Someone in the field would hand-write all the pertinent information, like who the order was for, on a paper pallet tag then rewrite it on a tear-off portion, which came to the office. We had to manually track everything,” Losely said.

The nursery eventually adopted a computer printed pallet tag with a bar code. As product came in, the barcode was removed from the pallet tag and scanned in the office with a hand scanner.

“The computer did the work, but the office staff had a hard time keeping up with scanning all the tags during peak shipping times,” he said. “Our order system worked well for getting things harvested and brought into our central shipping area. But where things broke down was tracking that material as it came in. We needed to know if it came in and where it was.”

Now the nursery uses handheld scanners from Psion and a software package designed by Jerry Peyton of Vista Data Systems. The system and the handhelds allow Losely and his crew to not only know that a pallet has made it to the shipping yard, but the system tells the forklift operator where to put it.

“Each location in the yard has a pallet quantity associated with it,” Losely said. “A1, for example, can hold 10 pallets. When pallet No. 11 gets scanned, the system knows A1 is full and sends the forklift operator to B2.”

The system has increased efficiency in order fulfillment by 30 percent, Losely said.

“If we’re loading a truck and an entire order won’t fit on one truck, but the customer needs a specific item in the order, we can find it and make sure it gets on that truck,” he said. “I can’t tell you how much that’s improved handling specialty requests.”

The system was also designed to prevent shipping mistakes. If the wrong pallet is loaded on the truck, the handheld’s screen flashes red, signaling the operator it’s the wrong pallet. But when the pallet is correct, the user pushes a button on the scanner and all the information is sent to the office.

“My wife and I don’t miss all those nights going through tickets,” Losely said.

**FOR MORE:** [www.losely.com](http://www.losely.com).



The Psion handheld units are rugged and hold up to the tough nursery environment.

# Wood-boring pests are a sign of plant stress



The peach tree borer is a clearwing moth that tunnels into trees in the same manner as a beetle borer.

**M**ost insect borers are attracted to weakened, damaged, dying or dead plants. These are referred to as “secondary invaders” because they attack only after a plant has been weakened by another stress. Secondary invaders are a good indicator of other problems with the health of the tree, and their presence may contribute to the tree’s decline.

## Longhorned beetles or round-headed borers

Adults are called longhorned beetles because their antennae are as long as or longer than their bodies. They lay their eggs on bark, and newly hatched larvae tunnel underneath bark and into the heartwood. The tunnels are oval to almost round in cross sections. While tunneling, larvae may pack their tunnels with excrement (frass) that looks

like compressed wood fibers, or push frass out of the holes they produce. You can often detect an infestation by the frass that may be visible on the bark. This group is rarely a problem in nursery production. Since the larvae burrow into the heartwood of the tree, the larvae can’t be managed once they infest the tree. Preventive trunk sprays can be used to protect the trees from infestation.

## Metallic wood-boring beetles or flatheaded borers

Adult beetles are flat and boat-shaped, and they have large eyes, short antennae and distinctive metallic colors. They can be green, blue, bronze, black and copper. Their larvae have widened, flattened body segments just behind their head. As the larvae tunnel beneath bark, they produce oval

or flattened tunnels in cross sections. Metallic wood-boring beetle feeding usually girdles the trunk and branches. If the tree is small or if enough beetles are present, this girdling can result in disfigured trees or even death. Preventive trunk sprays are often effective.

## Clearwing moths

There are a number of clearwing moths that can be pests of nursery crops. The larvae of the moths tunnel into the trees in the same manner as beetle borers. Depending on the species, different parts of the tree can be attacked. The caterpillars can be identified by their “false legs” on the undersides of some of the abdominal segments. These are not found on beetle larvae. Peach tree borer is probably one of the most important pests in this group. Larvae tunnel into the roots and lower trunks



of peach, cherry, plum, nectarine and apricot. They feed on growing tissue and inner bark. Infested trees can be identified by masses of sap around damage sites at the base of the trunk. Other clearwing borers include lilac or ash borer, dogwood borer and lesser peach tree borer.

### Managing wood-boring insects

Most wood-boring insects are secondary invaders. If your trees are being attacked, they are probably under stress. If you have more than the random plant being attacked, then you probably need to assess your production practices. Proper tree care discourages most borer pests and will help the plants survive an attack. Sap flow from healthy trees is their primary defense from damage by many borer pests.

There are some practices that you want to avoid to prevent borer attack. Delayed potting of trees to a large container size can stress trees. But with the current financial situation, many growers are holding on to plants longer than they should before shifting them up. If you are trellising your trees,

make sure the support wire is not damaging the tree. There is often a strong relationship between trees damaged by trellises and a borer attack. Under- and over-watering and too much or too little fertilization can also stress the

trees. If you use slow-release fertilizer that releases based on temperature, try to avoid putting it out in the heat of the summer when you could get a large release of nitrogen into the pot.

— Texas A&M Entomology



Indication of a longhorned beetle infestation.



Chrysobothris sp., a wood-boring beetle.

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PERFORMANCE value  
innovation



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By Heping Zhu and Randy Zondag

# Sprayer selection

Make sure your pesticide sprayer choice isn't costing you money

Despite even more stringent market requirements, applications of pesticides and other pest or disease control strategies have successfully ensured continuous production of high quality ornamental nursery crops. Since chemical pesticides were first developed 150 years ago, pesticide delivery systems have changed dramatically, from primitive hand-held paintbrush applicators to modern tractor-driven air-assisted sprayers and aircraft sprayers.

However, proficient applications of pesticide often are complicated by many factors. These include the use of a

variety of equipment and methods, incompatible physical properties of different chemical sprays, diverse crops and their growth habits, numerous pests and diseases, disparity of operator skills, uncontrollable weather conditions, extensive worker safety, environmental regulations and fluctuating economics related to the benefits of pesticide applications.



Air-blast sprayer



**Kendall Hill Nursery** in Newark, Ill., uses Weed Badgers, which reduces herbicide applications.

## about >>

Kendall Hill grows shade trees, ornamentals, evergreens, deciduous and broadleaf shrubs.

## for more >>

[www.kendallhillnursery.com](http://www.kendallhillnursery.com).

**GROWER  
SPOTLIGHT**

## Sprayer selection

Selection of a sprayer must take into account its capabilities and limits to effectively deliver the optimal amount of spray under specific conditions. However, current pesticide application guidelines for growing, protecting and marketing nursery crops are inadequate. This dilemma contributes to an increased use of pesticides and lowers spray application efficiencies in nursery crops. Consequently, excessive pesticides are often applied to target and non-target areas, resulting in greater production costs, worker exposure to unnecessary pesticide risks and adverse contamination of the environment.

Education is essential in any pest control strategy to have properly trained operators and to make the proper sprayer selection. Our research has demonstrated that growers could use their existing spray equipment to reduce pesticide and water use by 50 percent by properly changing spray nozzles at no extra cost and still achieve the effective pest and disease control. This is equates to doubling the pesticide application efficiency with reduced pesticide costs, reduced health risk to applicators and diminished adverse impact to the environment.

## Air-blast sprayers

Air-blast sprayers are most commonly used to apply pesticides to plants with upright habits. They have adjustable nozzle angles and the capability to turn their nozzles on and off, providing a flexibility to accommodate the wide variety of tree





Cannon sprayer.

shapes and heights found in many nurseries. Large nursery trees require large air-assisted sprayers with large fans to produce an adequate air volume for spray delivery to target areas.

Unfortunately, these conventionally designed air-blast sprayers have low efficiency and low deposition uniformity across tree tops, resulting in target areas that are either over-sprayed or under-sprayed. Custom-designed or modified air-blast sprayers can provide more efficient deposition. Despite their disadvantages, conventional sprayers will most likely continue to be used if the overall savings from custom-designed sprayers are not cost effective.

### **Tower sprayers**

Tower sprayers are also

widely used in ornamental nurseries. Because spray clouds from tower sprayers can be directed horizontally or inclined toward the tree canopy, spray deposition and coverage on targets are less variable from tower sprayers than conventional air-blast sprayers. That capability also minimizes the amount of sprays that are carried above target canopies. Since the height of tower sprayers is fixed, tree tops taller than the sprayer are missed or inadequately sprayed.

### **Boom sprayers**

In container crop production, boom sprayers, air-assisted boom sprayers and backpack sprayers are commonly used. For these sprayers, selection of nozzle type and size is critical and is dependent on crop

characteristics, pest types and weather conditions. Horizontal boom sprayers are generally used for short container-grown woody plants.

They have two long spray booms that extend out both sides of the tractor. The total lengths of spray booms can range from several feet to over a hundred feet. These sprayers are modified conventional boom sprayers with air shrouds hung along the boom to direct small spray droplets into lower canopies and reduce spray drift.

Vertical boom sprayers are usually used for liners. They have drop nozzles, a pipe extension perpendicular to the boom, to discharge sprays closer to target areas. During the past decade, air-assisted boom sprayers

were introduced for treating denser and taller crops because they have superior penetration capability and provided better coverage than conventional boom sprayers.

Backpack sprayers are preferred for spot treatments in small acreages or in hoop houses. Mount a constant flow rate valve upstream of the nozzle tip to prevent inconsistent sprays from pressure changes.

Air-assisted boom sprayers equipped with electrostatic devices discharge small charged droplets that may increase spray accuracy. In laboratory experiments, excellent spray coverage on leaves is achieved. However, due to uncontrollable variations in wind speeds and disparate crop characteristics, electrostatic sprayers do not achieve a consistent level of performances in the field.

### **Cannon sprayers**

Air-assisted cannon sprayers can cover wide spray swaths without the long booms used in conventional boom sprayers. Because of high airflow velocity, these sprayers can penetrate canopies and create turbulence that disturbs plants and increases spray deposition on upper and lower leaf surfaces. Compared with conventional boom sprayers and air-blast sprayers, cannon sprayers are small, easily transported and stored, and only require a small path for spray application. However, cannon sprayer performance is greatly influenced by wind conditions.



## GROWER SPOTLIGHT

**Tankard Nurseries** in Exmore, Va., uses nylon straps to keep trees from blowing over. The straps don't harm the trees, and they're easy to attach or detach.

### about >>

Tankard grows trees, shrubs, perennials and ornamental grasses.

### for more >>

[www.tankardnurseries.com](http://www.tankardnurseries.com).

### Tunnel sprayers

Tunnel sprayers were introduced for trees with small canopies during the past decade. They are either air-assisted sprayers or boom sprayers mounted with vertical booms. The fabric-covered frames of tunnel sprayers enclose the target tree and minimize spray drift. Sprays that are not deposited on the targets are recycled back to the spray tank. Disadvantages of tunnel sprayers are their large size, complicated structural configuration, frequent maintenance requirements and difficult transportation. Since the frames of the tunnel sprayer contact the trees, the sprayer can become contaminated with plant pathogens such as the fire blight bacteria and in turn can spread the bacteria to other trees.

### Future sprayers

Safe, user-friendly and intelligent or semi-intelligent sprayers may answer the needs of nursery crops. The new advanced intelligent

sprayers should deliver pesticides economically, accurately and require minimum human input during the entire spray application process.

Hopefully, future sprayers will have an intelligence capability that will apply pesticide rates to match canopy size, shape and density. The intelligence system should be integrated with reliable sources where real-time analyses and accurate predictions can be obtained for population, movement and infestation of pest insects in a geographical area. This can lead to more effective timing of spray applications to prevent a buildup of pest populations. However, development of advanced sprayers will encounter a finite demand in the market, limited acreages in nursery crop production and growers' uncertain, long-term financial plans. **NM**

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Tower sprayer.