

# It's only a matter of time

You know that good turf deserves the best forms of nitrogen. That's why you need slow-release NITROFORM® and controlled-release NUTRALENE™, two superior formulations that cater to your specific nitrogen needs.



With NITROFORM®, nitrogen is released slowly throughout the growing season and remains available to roots for one year or longer—when other nitrogen sources have been used up. Ideal for sandy soils where low micro-organism levels and leaching are often a problem. It also works well in clay soils since it stimulates micro-organisms that decompose thatch. Available in both dry and liquid formulations and applied at recommended rates with conventional equipment, NITROFORM won't burn top-growth or roots. So treated turf is subjected to less stress. As a result, it grows stronger and needs fewer pesticide applications.

## NITROFORM®

- Consistent 38% nitrogen
- Sustained, predictable nitrogen release by soil bacteria when most needed by roots and vegetation
- Keeps providing nitrogen for a year or longer (12 to 16 months)
- Some nitrogen remains in the soil for the next growing season
- Non-burning, low-salt index
- Low leaching and volatilization
- Reduced thatch build-up

IMPORTANT: Please remember always to read and follow carefully all label directions when applying any chemical.

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With dual-action NUTRALENE™, you can count on quick grass greenup in spring plus sustained release throughout one growing season. Unlike other controlled-release nitrogens, NUTRALENE is not solely dependent upon soil temperatures, moisture, coating or particle size for its optimum release pattern. Applied in chip or granular form, the dual release of NUTRALENE encourages outstanding growth response—even in early spring or late fall. In hot weather, its reduced leaching characteristics enable uniform, sustained feeding to continue.

## NUTRALENE™

- 40-0-0 guaranteed analysis
- Controlled release dual action to provide quick initial greenup
- Complete availability of nitrogen within one season (12 to 16 weeks)
- No nitrogen carryover
- Non-burning, low-salt index
- Reduced leaching and volatilization
- Low thatch build-up

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Now's the time to rely on NITROFORM® and NUTRALENE™ for high quality Nitrogen.

generating capability, chances are that more deliberate steps will be taken to maximize its up-time efficiency.

To get the most out of your fleet, start with the basics. Develop and follow a comprehensive maintenance schedule, and keep accurate records of individual car's use. Insure equal use of all fleet cars by rotation; don't fall into the "last car in, first car out" trap, which unevenly distributes workload on select cars.

And to monitor costs, create a cost accounting maintenance chart that divides vehicle operation costs into two categories: "maintenance" (labor, service, fuel and parts associated with daily operations), like topping off the fuel tank, battery charging and cleaning; and "upkeep" (labor, service and parts that contribute to vehicle longevity and long-term performance), like tire rotation, filter replacements, engine valve adjustments, battery service and steering mechanism adjustment. In this way, daily operational costs and costs aimed at extending service life can be independently monitored.

You can thus show management the nominal costs associated with good upkeep, the value of a quality maintenance program and its relationship with fleet longevity.

### Gasoline cars

For gasoline engines, the usual items like gas, oil, spark plugs and filters must be added or replaced on a consistent basis for a car's regular use.

If a car hasn't seen regular use, top off the fuel tank to help dilute stale gas and check all fluid levels, including the battery. After starting the car, let it run for a brief time and remember that if stored or inactive for a long period, the engine is liable to emit smoke for several minutes due to the gas/oil mixture that will have seeped into the combustion chamber.

Establishing regular intervals for in-depth maintenance of gasoline cars—tasks within the realm of preventive maintenance—will help assure maximum up-time and contribute to vehicle longevity.

### Electric cars

For electric cars, several special maintenance procedures can drastically extend a battery's life. During a new car's initial break-in period, the service life of the battery will be extended if the car is only run 18 holes between charging. Keep a battery at least  $\frac{3}{4}$  charged at all times. This not only influences performance, but keeping a battery at or near peak charge significantly extends its ser-



A preventive maintenance program and effective refueling/recharging practices are essential to revenue-producing golf car fleets.

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*A fleet plagued by costly down-time is the source of golfers' frustrations, management concerns and diminished profits.*

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vice life. Use only distilled, purified water when refilling batteries; never use pond water or hose water as the chemical contaminants and hardness of the water will, in effect, "poison" the battery fluid.

To obtain the best performance from electric golf cars, it's best to complete the fleet's charge just prior to tee-off. However, as any superintendent knows, this is not always possible. Because of convenience, cars are often charged at day's end and come off the charge sometime during early morning hours, permitting the batteries to cool down. There are devices that either delay or control the time and depth of charge, each with their own advantages and disadvantages.

Timers enable the maintenance staff to control when the batteries will come off charge, but timers typically overcharge an average of 22 percent, which wastes electricity and damages batteries. Since a battery operates stronger and longer when warm, golfers will be getting a car in peak performance. The disadvantage, of course, is that a battery's service life may be adversely affected. An automatic charger can better control the depth of charge, but no effective means to regulate the timing of the charge is available. In either case, examining variables such as weather, season, battery condition and fleet demand

will help determine which type of system to use.

### Extending life

Think of it this way: What is it worth if, as a result of good maintenance habits, your fleet's overall average service life is extended by a mere six months? To put it in perspective, simply multiply added rental fees and deduct maintenance and overhead costs, and the ends will surely justify the means.

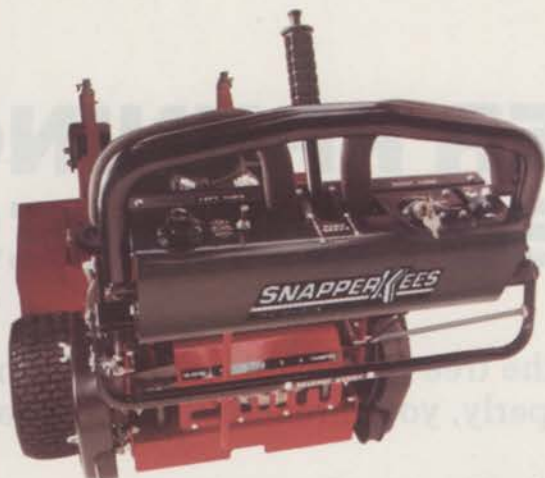
All golf courses want to operate at peak performance and generate maximum revenues. By taking steps to make certain your golf car fleet runs at peak performance, you have also assured maximum revenue-generating performance. Don't underestimate the profitability of a well-maintained fleet with outstanding up-time figures. All things equal, the golf car fleet is among the only revenue generators with which greens superintendents can play a significant role and greatly impact overall course profitability.

LM

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John Allison is field service manager in the Golf and Utility Vehicle Division of Yamaha Motor Corp. USA. He oversees all service activities for the firm's golf car line and functions as liaison between Yamaha and its network of more than 60 independent dealers nationwide.

# STEP INTO THE OFFICE



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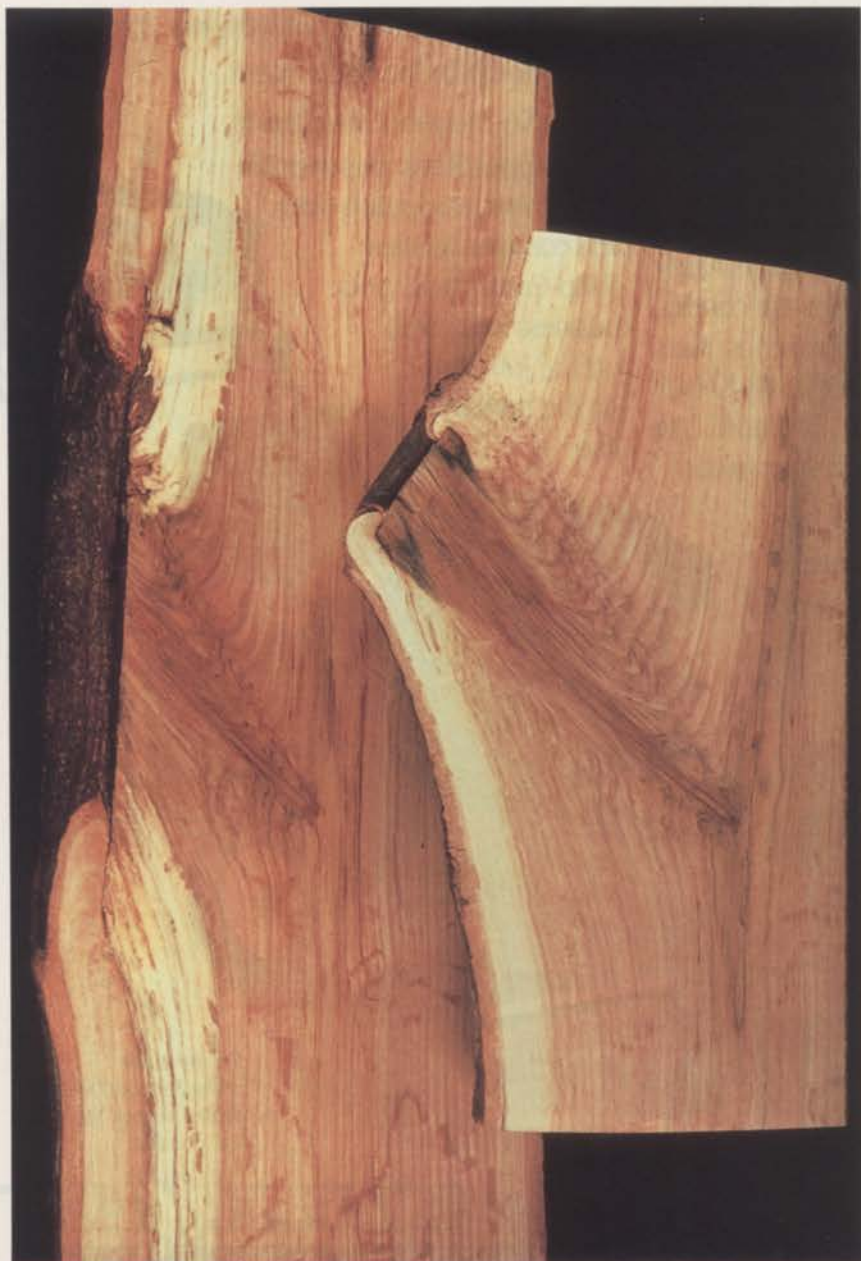
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# PROPER PRUNING RESPECTS TREES

If you prune properly, the tree can readily cope with the injury.  
If you prune improperly, you threaten the tree's health.

by Alex Shigo, Ph.D., Shigo & Trees, Associates



Two samples from the same red oak tree that had branches of the same size and age cut off six years earlier. The improper cut (left) had large ribs of woundwood and a large column of rot. No rot developed after the proper cut.

**P**roper pruning respects tree beauty and dignity, and helps maintain tree defense systems. Improper pruning, on the other hand, destroys beauty, dignity and defense systems.

Proper tree care starts with an understanding of how trees grow and defend themselves. Pruning is one of the beneficial tree practices. But too often, people think that because trees are so big and tough, you can prune them in any way and treat them in any way and they will continue to defend themselves.

We are seeing now that this is not so. There are limits to what a tree will endure.

Proper pruning is the removal of living, dying and dead parts of trees to benefit them. Pruning removes branches that could result in large wounds if they fell. It also corrects defective form that could result in branch failure.

It is time for some changes in the ways we treat trees. Decisions must be made on the basis of an understanding of tree biology. And, most importantly, changes must be made to seven tree pruning practices that cause serious injury.

1. Know the size and shape of the tree you want.
2. Do not flush cut.
3. Do not leave living or dead stubs.
4. Do not wait to top and tip large trees.
5. Do not over-prune.
6. If pollarding, start with a tree that lends itself to the practice.
7. Do not apply wound dressings over rotted or infected wood.

## What you want

Besides knowing the size and shape of the tree you want, you also must know your planting site, and select trees that will grow best there.

Decide what kind of trees you want: tall, small, weeping, fruit-bearing.

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ing, etc. Then learn what kind of site you have: wet, dry, acid, alkaline, clay, sand, etc.

When planting trees, keep these hints in mind:

- Plant at the depth the tree grew in the nursery.

- Do not fertilize until the tree is established.

- Water properly; too little or too much is harmful.

- Keep grass and annuals away from the new tree.

- Add amendments if soil structure is poor, but do not over-amend the soil.

- Do not wrap trunks or accept trees with wrapped trunks.

- Do not accept trees with flush cuts and wound dressing.

- Know the light requirements of your trees.

- Prepare a planting site, not just a small hole.

- Loosen the soil deep and far beyond the crown dripline.

- Remove only dead and dying branches and roots.

- Support, but not so rigidly that the tree cannot move.

### No flush cuts

Pruning a branch by cutting it flush

with the trunk or branch it arises from forces the tree to sacrifice large reserves of energy and considerable amounts of wood. Unfortunately, some tree care professionals and many books on pruning still advocate making flush pruning cuts.

Flush cuts and wound dressings stimulate large callus that rolls inward and prevents wound closure. Flush cuts start more than 14 serious tree problems.

### Over-pruning causes weakening of roots and promotes root diseases.

Make pruning cuts as close as possible to the collar at the branch base, but do not injure or remove the collar.

### Food stubs

Living or dead stubs are food for organisms that start rot and cankers.

Trees do not heal as people do, by regenerating damaged tissues. Instead, they sacrifice injured wood to protect the healthy. In the vicinity of a

wound, trees activate storage cells. The cells convert their stores into compounds that coalesce around the wound and form boundaries that restrict the spread of diseases and insects. The isolated wound dies, but the rest of the tree lives on.

The best way to treat wounds is to prevent them in the first place. Wounds can be made by wire in hose bracing, lawn mowers and string trimmers.

If bracing is needed, use broad, belt-like strapping that will not cut into the bark. The tree should be able to sway slightly. Remove bracing after the tree is firm in the soil, one or two years at the most. Do not use wire in a hose!

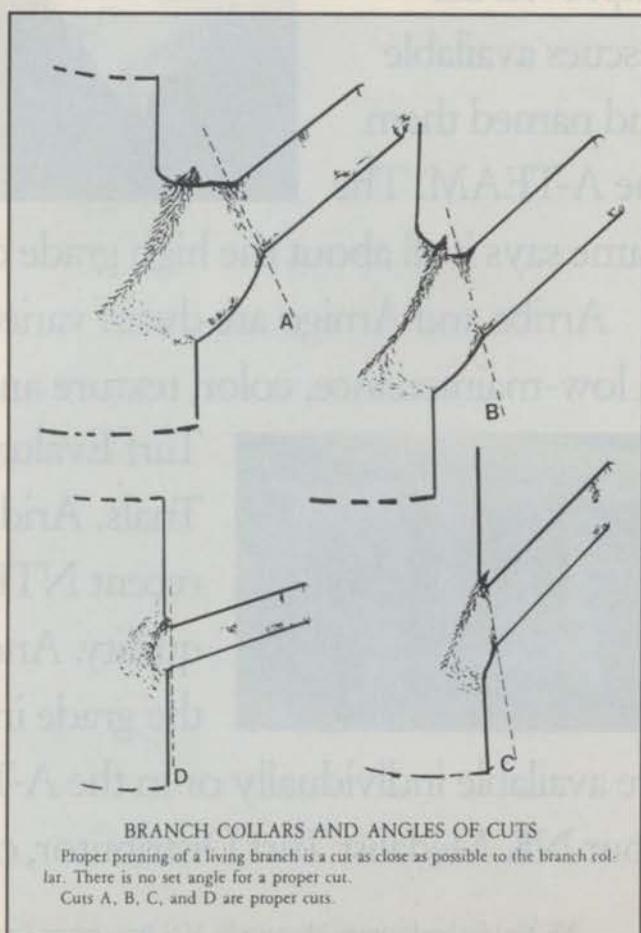
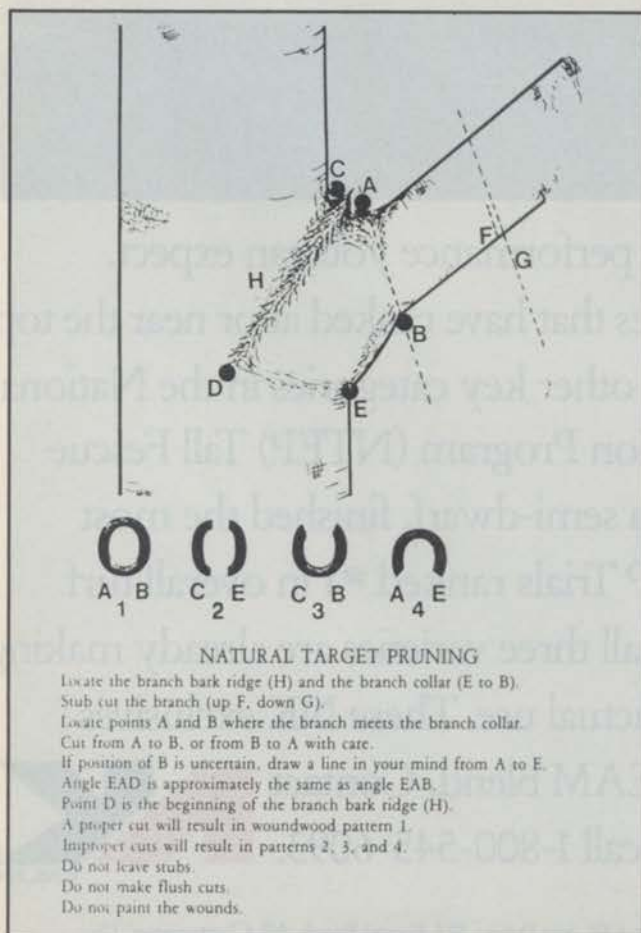
### Tipping

Topping or tipping causes serious injuries to large trees and leads to hazardous conditions. Proper early pruning can regulate tree height and make later topping unnecessary.

If you think your mature tree needs topping, maybe you need a new tree, especially if it is under a power line.

So do not plant trees under power lines, or plant only small-maturing species, or start pruning when the trees are small.

*continued on page 52*





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LANDSCAPE MANAGEMENT is written for golf course and landscape professionals, while LAWN CARE INDUSTRY satisfies the information needs of chemical lawn care professionals. Together, they provide total show and industry news coverage.

You could call their editorial and marketing teams "roadies," because they spend 50% of their time traveling to shows, tracking stories and getting candid perspectives from suppliers. Listed here is just a portion of the shows they'll be attending this year. Frankly, it's the only way to stay on top of late-breaking news and keep both books fresh and on the cutting edge of their market segments. This dedication makes them the authoritative voices on industry problems and opportunities readers need to be aware of...and explains why their competitors look like warm-up acts.

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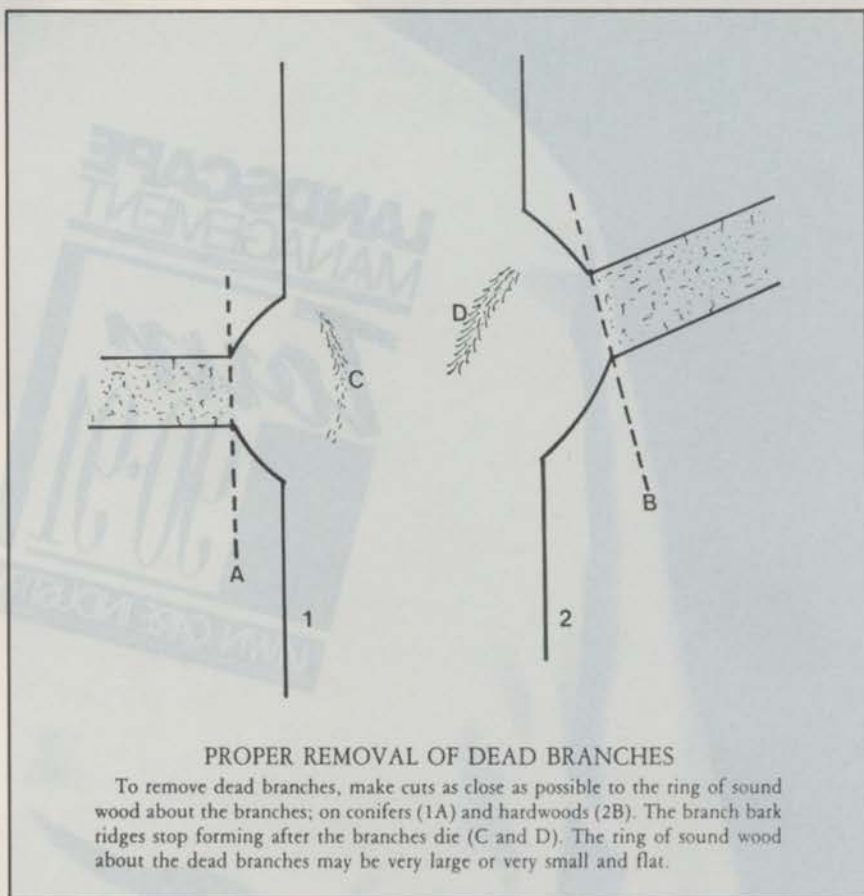
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#### PROPER REMOVAL OF DEAD BRANCHES

To remove dead branches, make cuts as close as possible to the ring of sound wood about the branches; on conifers (1A) and hardwoods (2B). The branch bark ridges stop forming after the branches die (C and D). The ring of sound wood about the dead branches may be very large or very small and flat.

#### Pruning and pollarding

Over-pruning causes weakening of roots and promotes root diseases. Over-pruning will also allow excessive sprouting and infestation of boring insects.

If pollarding, establish the desired framework when the tree is young and small. Remove sprouts every year, and do not injure the pollard heads.

#### Applying dressings

Remember that dressings do not stop rot. Trees respond to wounds by forming boundaries. Boundaries defend the liquid transport, energy storage and mechanical support systems. Boundaries resist spread of pathogens into wood. After wounding, trees form another boundary that separates infected wood from healthy wood that continues to form.

Sometimes tree wounds stimulate the growth of woundwood, which may roll inward to form a "rams horn" and prevent closure. To treat wounds properly:

- Remove injured bark and wood.
- Do not enlarge the wound or break boundaries. Do not clean cavities deep into sound wood. Do not insert pipes to drain water from cavities.
- Do not point the vertical tips.

● Do not paint the wounds.

We are responsible for trees. As Saint-Exupery has written: "You become responsible, forever, for what you have tamed." **LM**



Since retiring from the U.S. Forest Service in 1985, Dr. Shigo has made a career of educating people about trees. His books and brochures are available from his headquarters at 4 Denbow Rd., Durham, NH 03824; phone (603) 868-7459.



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# BEYOND THE GREENS... WHY NOT REDS, YELLOW, AND PURPLES?

Bedding plants add color and beauty around the golf course

by Kathy Zar Pepler

**T**he many varieties of bedding plants available today provide landscape professionals with an artist's palette of rich colors and textures.

"With smart use of these easy-to-care-for plants, the traditional lush green golf course can be transformed into a spectacular canvas of color. All you need to create your own artistic masterpiece is your imagination, a little knowledge, and effective communication with your grower," explains Terry Numfeld, executive director of Professional Plant Growers Association in Lansing, Mich.

Bedding plants are particularly suited to enhancing the beauty of golf courses because of the instant, bright color they provide. "People respond emotionally to a large splash of one or several colors, and unexpected splashes of color strategically positioned throughout a golf course are especially appealing," Numfeld adds.

After incorporating 15 bedding plant species, 380 flats, and 22 beds into the landscape last year, Susan Crosley, staff horticulturist at the Findlay (Ohio) Country Club reports that long-time members often comment on their beauty. Susan's husband Clay, the club superintendent, adds, "For every compliment I got for the golf course, she got at least two. I kidded her that she stole the show."

While the club planted flower beds in the past, it was not until 1990 that the beds looked spectacular. Why? Because it wasn't until fall of 1989 that Sue and Clay began at the club.

The first thing Sue did was assess where the flower beds should be located. Three of the 22 beds were critical: the "circle bed" at the club's entrance, the "transition" bed between the club and tee, and the "logo" bed behind the 18th hole. It was important to Sue that these special beds would create just the right mood.



Annual flower beds used to enhance the beauty of at the Findlay Country Club include more than 2,520 annuals.

## The circular bed

Because the circular drive to the club's entrance was highly visible and formal, Sue wanted to emphasize this theme in the circle beds. She did so by using 25 flats of one variety of a yellow marigold, 15 flats of white alyssums and five flats of red salvia in the 2,000-square-foot beds. "I wanted these beds to bloom continuously all summer long," explains Sue, "and I thought the yellow (the theme color) would be a nice contrast against the dark green yews."

She decided to use white alyssum to further highlight the yellow marigolds. In front of the foundation yews, Sue selected red salvia as yet another distinct and dramatic accent.

The easiest way to create a formal bed is by using annuals, one variety (one color). Somewhat low-growing, well-mounded species tend to appear more formal, such as fibrous begonias,

tuberous begonias, geraniums, impatiens, New Guinea impatiens, French marigolds, petunias and vinca.

When a 2,000-square-foot bed is designed and one variety is used, it's important to allow for enough lead time for the grower to be able to grow the color required. When several colors are used in a bed, whether it be one or several species, it's a good idea to use at least two to three times as much of the darker color than of the lighter color.

Why? Because dark colors recede and light colors appear to pop out, providing a better balance.

When two colors of one species are used together (like hot pink and white impatiens) be sure the two colors are in the same series. A series is like the last name of a line of colors, such as 'Yellow Boy', 'Golden Boy', 'Orange Boy', and 'Harmony Boy' in the "Boy" series of marigolds.

*continued on page 62*