

**THE CHALLENGE OF CARING FOR TURF AND TREES AT  
ARLINGTON NATIONAL CEMETERY**

**Erik Dihle  
Chief of Horticulture  
Arlington National Cemetery, Arlington, VA**

Arlington National Cemetery, the final resting place for over 275,000 Americans, is considered by many to be our nation's most sacred shrine. Overlooking the Potomac River, Arlington was established in 1802 by the step-grandson of George Washington and served as a Virginia plantation until the outbreak of the Civil War. Arlington changed forever in 1861 when long time occupant Robert E. Lee accepted command of the Army of Virginia, left Arlington, and never returned.

Union troops occupied the plantation's thousand-plus acres and used the mansion as both hospital and headquarters. By 1864 they began to bury their casualties on the grounds. Throughout the years the "field of the dead" increased in size, the forested land was cleared, "freedman's villages" rose and fell, and Arlington became what it is today: An active burial cemetery honoring both heroes and the common man (and woman).

Today Arlington conducts close to 6,000 funerals annually and performs another 3,000 ceremonies per year, such as wreath-layings at the Tomb of the Unknowns and head-of-state visits. Over five million tourists and next-of-kin walk the grounds of Arlington each year – making the cemetery one of the most visited sites in the Washington area.

The cemetery is maintained by a staff of just over 100 federal employees and an equal number of contracted employees. Historically, grounds care has been performed by in-house personnel. But with our current administration and Congress' renewed focus on partnership with the private sector, we are now transferring our most labor-intensive tasks to contractors. Most tree care and turf care, and all landscaping will be performed by private companies in 2001 - under government specifications and monitoring. Funerals and ceremonies are supported by elite units the U.S. Army's 3<sup>rd</sup> Infantry – "The Old Guard."

The cemetery is comprised of 522 acres of turf and developed landscape. In total, Arlington is 637 acres in size – including undeveloped land, roadways, etc. The turf is a cool season mixture of Kentucky bluegrass and fine fescues in our older burial sections, and in our newer areas tall fescue now predominates. Common bermudagrass - an unwanted guest - has invaded the grounds and is particularly heavy on the cemetery's southern slopes. Approximately 14,000 trees dot the landscape, varying in age from "new in 2000" to "growing here in 1776." Shrub and garden beds are found throughout the grounds, but are concentrated in high-visibility areas such as our visitor center, Tomb of the Unknowns, and the presidential gravesites.

We are grateful for the kind words of visitors as they view our grounds, but I am most attentive to the occasional concerns raised by next-of-kin and friends of those buried in Arlington. Their number one concern, in a word, is “turf,” and the number one factor affecting our turf quality is *mechanical damage*. The damage appears in various forms:

- a. Soil compaction. The backhoes and heavy earth-movers from 25 funerals a day will do that to you! The burials, by the way, are not confined to newer sections of the cemetery, but occur throughout all 522 acres, including old established burial sections.
- b. Tire and tractor-tread ruts. Soil compaction in its severest form – see above!
- c. Collapsed or otherwise sunken graves. In its mildest form this creates a ‘corduroy-effect’ as one walks or rides through a burial section. At its most dramatic, a grave can – literally overnight – turn into a chasm several feet deep.

Certainly other factors affect our turf quality: Pedestrian traffic, the natural thinning and bunching of certain turf species, weed encroachment (a particular challenge in our mechanically damaged areas), and drought. (No more than 20 acres of Arlington’s turf contains functional irrigation systems.)

Corrective action for poor turf quality follows the commonsense approach followed by most managers. Primary components of our turf care program are as follows:

- a. Adjust pH levels to maximize nutrient uptake. Up to 200 tons of pelleted dolomitic limestone are applied annually.
- b. Between 2.75 and 3.00 pounds of nitrogen per 1,000 square feet are applied annually to all turf areas in three feedings – up to 0.75 lbs. in late May, 1.25 lbs. in September, and one pound in late fall to build-up carbohydrate reserves. A slow-release poly and/or sulfur coated material is used in the first two feedings, and an agricultural grade fertilizer – high in phosphorous and potash – is used in late fall. Additional feedings, depending on the visual appearance of turf and lab analysis, may occur in high-visibility areas.
- c. Core-aerate all turf areas twice yearly.
- d. Apply liquid broadleaf weed control to all turf in the fall, and again in spring – as needed. Narrowleaf weed control (primarily for crab and goosegrass) occurs on approximately 190 acres in a granular formulation.
- e. Apply insect and disease control to specific areas – based upon a weekly regimen of monitoring. Usually this will not exceed 20 acres per year.

- f. Mow high. I still maintain this is the number one form of weed control for cool season turf. We specify a mowing height of three inches. At five inches (generally once a week), it's mowed again. Each individual headstone is trimmed weekly with a string trimmer. This keeps quite a large trimming crew busy full-time (!).
- g. Renovate the poorest 25 acres of turf each year: Apply glyphosate, then dethatch, core aerate, aerate/slit-seed, fertilize, broadcast with additional seed, and drag with a flexible-tine harrow. We begin the sunny areas in late August and the heavily shaded areas are renovated in late winter.
- h. Particularly severe areas of damage – approximately seventy 3,000 square foot areas per year – are rototilled, leveled, and hydroseeded.
- i. In addition, we install fresh sod on both new and old gravesites. 60,000 square yards of sod will be laid in 2001. The locations are scattered throughout Arlington's entire acreage, and the sodded gravesites are established through a series of visits from water tank vehicles varying in capacity from 200 to 2,000 gallons. We only purchase sod grown under the Maryland or Virginia sod certification program.

A final comment and warning on caring for turf in a cemetery setting – particularly one of Arlington's size (and this is something difficult to convince others of until they experience it firsthand): There are a lot of headstones blocking your path, the terrain can be very rough, and all those funerals can slow you down! Never bid a cemetery job by looking at it on paper! Throw away your usual formulas for estimating labor and equipment! A patch of cemetery turf is not an industrial park, it's not a school ground, it's not a golf course. It's an *obstacle course* of up to 200,000 headstones; dips, dives, and slopes; and millions of impervious tourists watching what may seem to be never-ending funerals and ceremonies! A regular boom sprayer won't apply your chemicals (remember all those headstones), nor will a regular walking pattern with a hose-end applicator. Come visit, and be prepared to modify!

Factors affecting the health of trees overlap with the challenges faced in turf culture (again, mechanical damage): Branches hooked by equipment are broken, trunks are scraped, root flares are hit by string trimmers, soil is compacted, and roots are severed during interment operations. As we conduct a burial, adjacent trees – most of which are irreplaceable in our lifetime – experience up to a 33 percent root loss or more. No wonder I see crown dieback when called to find out what's wrong at the gravesite of the General buried “under the shade of the old oak tree.” Arlington is in a sense an arboretum, a beautiful shrine to those interred long ago. But it is also first and foremost a place of active burials, and it is an unfortunate fact Arlington's trees are sometimes the victim in this twofold mission.

A rundown of our annual care for trees, shrubs, and gardens:

- a. A small in-house tree crew provides minor shade tree and woody ornamental pruning. This is inadequate of course for Arlington's 14,000 trees, so we supplement by contracting local tree maintenance firms (to the extent our limited funding permits). Our goal is to eventually achieve a five rotational pruning cycle for all our trees. We also 'rely upon the kindness of strangers,' as noted in the final paragraph of this paper.
- b. We deep-root fertilize our trees eight to ten months of the year, and in addition we water approximately 500 young trees throughout their growing season. Vertical mulching is planned for the more compacted areas under our larger shade trees.
- c. Ground pruning of suckers, deadwood, and ivy removal is performed by two teams of personnel throughout the year. Eight to ten thousand linear feet of hedges and shrubs are pruned annually.
- d. Pest control is performed as needed. Cosmetically, our worst insect problems have been holly leafminers (Arlington has an impressive collection of old American hollies), boxwood psyllids, and tent caterpillars. Our potentially fatal attacks include scale insects (obscure scale on oaks – they *love* stressed trees) and, of course, gypsy moth. An integrated pest management monitoring system and control strategies are implemented whenever possible.
- e. Over 2,000 tree basins and all shrub beds are mulched, weeded, and edged throughout the year.
- f. Although loss exceeds gain, we are replacing approximately 100 trees and 300-plus shrubs annually. Our goal by fiscal year 2003 is to achieve a one-for-one replacement policy, plus a replanting of trees lost years ago.
- g. Our most significant improvement in tree care is our recent recruitment of a full-time urban forester. I have tasked him with establishing a comprehensive tree inventory (using a GIS mapping system), and working with our interment operations to minimize tree damage.
- h. Up to 20,000 square feet of perennial and annual flower beds are planted spring and fall. There is also a small flower bed and vegetable garden next to the Arlington House which mimics Mrs. Lee's garden of 1860. Specialty work on such items as the planting of sedum between the granite rocks at the eternal flame of President Kennedy is performed on an as-needed basis.
- i. New landscapes usually are associated with expansion and construction projects within the cemetery, and are performed in cooperation with the Army Corps of Engineers.

I am asked questions about Arlington that are non-horticultural in nature, which is fine with me. “Who can be buried here?” (Military persons who died while on active duty, service members receiving certain commendations, career military personnel – and their spouses and minor children. Write us for more details!) “When will you run out of grave space?” (As it stands now, in the year 2025. However, we are in the process of acquiring adjacent land.)

My favorite question, though, is this: “Who takes care of Arlington National Cemetery?” The answer is, “We all do.” It’s our cemetery and our tax dollars. The cemetery falls under the Department of Army, but it enters the hearts of millions of Americans who care very deeply about those who served our nation. Just two recent examples: Both the Professional Lawn Care Association of America and the National Arborist Association have been donating “national days of service” to Arlington. Many hundreds of turf care specialists and arborists have come together from around the country to spend a day at Arlington – to contribute their labor and expertise to the American people. When these green industry representatives arrive, they see the same thing we all see when we first visit Arlington: That the cemetery is a busy place – that it must be a ‘challenge’ to care for – but that it is a challenge worth facing. The Old Guard troops who provide the honors for our funerals and ceremonies call Arlington “The Garden.” It is a garden that must always be worthy of those who rest within and beneath its landscape.