Some people may not need a pickup as much as they think they do.

It's a common sight. Pickup trucks roaming around oil fields, construction sites, farms and ranches, carrying little more than the driver. And his hard hat.

If that doesn't sound like the best use of 4000 pounds of gas guzzling sheet metal, maybe you should have a look at the vehicle below.

It's called a Yamahauler. It's got three wheels, a powerful four-stroke engine, shaft-drive, five forward speeds and reverse. Not to mention utility racks front and rear, a trailer hitch on the back that can tow whatever won't fit on the racks and a seat that can carry one person very comfortably.

And since a Yamahauler is smaller and narrower than a pickup, it can take that person more places. Through woods, up hills, over snow, across streams, swamps, mud, you name it.

All the while, the Yamahauler will be drastically lowering fuel bills.

Of course, if all that still hasn't sold you on the idea of three wheels instead of four, here's something else to think about.

For the price of the last pickup you bought, you could've bought a lot more than just one Yamahauler. You could've bought a whole fleet of them.

YAMAHA
Built for the fun of it.
Winter Damage

Cold temperatures this winter struck normally temperate regions of the South causing widespread damage.

by Michael A. Dirr, associate professor, horticulture, University of Georgia, Athens, GA

Expect considerable flower bud damage and stem dieback on deciduous and broadleaf evergreen shrubs this spring. The damage will be pronounced from Minnesota to Florida.

In Minneapolis-St. Paul lows ranged from -30 to -34 degrees F. In Athens, GA, the mercury fell to 3 degrees F.

In both locations, similar temperatures have been recorded in previous years. Unfortunately, this year the plants were not fully acclimated and had not reached their maximum cold tolerances when the December freeze hit.

Additionally, the low temperatures persisted which accentuated the degree of injury. Plant exposure to prolonged low temperatures is usually more serious than short-term exposure (several hours).

Cold acclimation

Cold acclimation occurs in two stages, the first being triggered by short days in late summer and fall. The second stage is triggered by repeated exposure to low temperatures as well as freeze/thaw cycles.

It is obvious from the temperature data for the Athens area, that the plants never received the necessary low temperatures.

The same was true for Minnesota, where Dr. Harold Pellett at the University of Minnesota Landscape Arboretum reported flowers buds of the Northern Forsythia buds above the snow line are often killed by cold temperatures. Vegetative buds, however, survive and leaves develop normally.

Snow insulates lower buds of rhododendron while upper buds are killed by a combination of wind desiccation and poor acclimation to cold.
Subdue. The most effective fungicide against Pythium blight and damping-off.

Pythium weather. High temperatures, high humidity and high anxiety. Once Pythium takes root, it can destroy turf within hours.

Unless you take a grass-roots approach to Pythium. With Subdue!

Subdue works both on contact and systemically.

Subdue fights Pythium blight and damping-off—as well as downy mildew (yellow tuft)—in two ways. On contact, Subdue destroys the fungi in the soil. Systemically, Subdue prevents disease from within grass plants. That's because Subdue is water soluble—easily absorbed by roots. So Pythium—and now, downy mildew—don't have a chance.

Subdue also controls costs.

Subdue's systemic action means longer, more effective residual protection. Fewer applications. Lower chemical costs. And savings in maintenance and labor. And Subdue's low application rate—1 to 2 fluid oz. per 1,000 sq. ft. for 10 to 21 days on established turf—makes Subdue the most cost-efficient protection you can buy.

Before Pythium weather strikes, subdue it. Use Subdue in a preventive maintenance control program. And get a good night's sleep.

Ciba-Geigy, Ag Division, Box 18300, Greensboro, NC 27419.

HOW TO AVOID SLEEPLESS NIGHTS DURING PYTHIUM WEATHER.

SUBDUE

Circle No. 274 on Reader Inquiry Card
Lights hybrid azaleas were killed. These azaleas were bred and selected for flower bud cold tolerance down to -45 degrees F. But, the plants did not acclimate and, consequently, flower buds were killed.

Forsythia buds are often killed by low temperatures. Flower buds will open below the snow line where they are insulated. Notice that the vegetative buds are seldom injured and the leaves develop normally. This points out that flower buds are more susceptible to low temperatures than vegetative buds.

The Rhododendron Society rates various cultivars by their flower bud hardiness. H-1 is cold hardy to -25 degrees, H-3 to -5 degrees, H-5 to 15 degrees, and H-7 to 32 degrees F.

Dehydrating winds
Coupled with low temperatures were dehydrating winds. The wind passing across a leaf or stem surface acts as a driving force to remove water (via transpiration) from the tissue. If water is removed from leaves faster than it is replaced, cells will die.

Flower buds are more susceptible to low temperatures than vegetative buds.

Additionally, if the soil is frozen, roots cannot absorb water and the injury is even greater.

In general, broadleaf evergreens were more severely injured than deciduous plants. Plants shielded from the wind suffer less winter damage.

Rapid freezing
Dr. John Havis, University of Massachusetts, has frozen and thawed leaves of Rhododendron catawbiense ‘Grandiflorum’ at varying rates. All leaves subjected to rapid freezing were killed. Slow freezing, rapid and slow thawing did not result in injury.

Rapid freezing probably does not occur frequently in nature. Dr. Pellett has measured plant tissue that was 20 to 25 degrees F. warmer than the air temperature on bright, sunny days. When a cloud passes overhead there is a rapid plunge in air temperature that results in the death of some cells. Over time, the cumulative effect is yellowish to brownish foliage.

This type of injury results in the poor winter color of Thuya occidentalis, American arborvitae, many junipers, other needle and broadleaf evergreens.

Nurserymen have selected away from this characteristic to provide Techny and Nigra arbor vitaeas which maintain dark green through the winter. Wintergreen Korean boxwood (Boxus microphylla koreana) maintains good green foliage color while the Korean form turns sickly brown.

Location and frost cracks
Proper siting of plants in the landscape can literally save lives or at least preserve foliage color. Controlled studies in Kansas and Minnesota have proven plants perform best on north, northeast and northwest exposures where temperature fluctuations in winter were reduced and summer temperatures were relatively cool. The south and southwest exposures were the worst.

Bark splitting and frost cracks may also result from great temperature fluctuations. Rapid temperature drops cause contraction and splitting. Frost cracks usually occur on the south or southwest side of trees. Norway maple (Acer platanoides) and London plane tree (Platanus x acerifolia) are particularly susceptible to frost cracking. Other species also experience this phenomenon to various degrees. The best remedy is to plant non-frost cracking species.

Winter protection comes in many forms, but the most logical is the use of plants that are perfectly cold hardy in your area. Invariably, plants are used outside their zones of adaptability and suffer from cold “comeuppance”. Gardenia is sold and planted in Zone 8 (10 to 20 degrees F.) but invariably is killed to the ground as it was in 1981-1982 and this year. In fact, plants look so bad this year, they may not resprout from the base.

Plants can be protected with burlap, boards, plastic structures, etc. Nurserymen protect their container plants by storing them in plastic covered houses. In the production phase this is acceptable but in a landscape situation it is almost impossible.

To prevent snow and ice damage on yews, boxwood and other plants that tend to split, tie branches with string, wrap in burlap, or build a protective cover.

Anti-desiccants (films) have been used with variable success on evergreens. The idea is to cut down on water loss through the leaves. Repeated applications through the winter might improve results compared to a single late fall application.

Readers are encouraged to write the magazine about their experiences with winter kill this year.

Since we are always learning, I’d appreciate observations from readers about winter kill in their area.

This article begins a regular series in WEEDS TREES & TURF on plant identification and problems. You may reach me by writing the magazine, 7500 Old Oak Blvd., Middleburg Heights, OH 44130. Let me know what you’d like to discuss.
No one grass seed combines every characteristic for every type of turf. That’s why Northrup King research has developed a complete line of Medalist Turf Products to meet specialized professional needs.

<table>
<thead>
<tr>
<th>MEDALIST TURF PRODUCT</th>
<th>MAJOR AREAS OF USE</th>
<th>SPECIAL FEATURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athletic Pro Mix</td>
<td>High maintenance athletic turf</td>
<td>Both are well suited for new seeding or overseeding. Fast establishing, excellent traffic tolerance, and rapid recovery. Provides good footing.</td>
</tr>
<tr>
<td>Athletic Pro II Mix</td>
<td>Low to moderate maintenance athletic turf.</td>
<td></td>
</tr>
<tr>
<td>Boulevard Mix</td>
<td>Any area with high pH (roadsides, sidewalks, boulevards, beachfronts, etc.)</td>
<td>Contains both “Fults” <em>Puccinellia distans</em> and Dawson red fescue which thrive on high saline or alkaline soils. Performs at low to high fertility levels.</td>
</tr>
<tr>
<td>Landscape Pro Mix</td>
<td>School grounds, cemeteries, golf course roughs, lawns</td>
<td>Fast establishing. Adapts to broad range of conditions and management levels. Low to moderate fertility requirements.</td>
</tr>
<tr>
<td>Overseeder II Mix</td>
<td>Fairways, tees, athletic fields</td>
<td>Fast establishing, traffic tolerant, disease resistant, penetrates compacted soil.</td>
</tr>
<tr>
<td>Medalist North Mix</td>
<td>Fairways, tees, cart paths, wear areas</td>
<td>Long term quality in high traffic areas. Clean mowing and disease tolerant.</td>
</tr>
<tr>
<td>Premium Sod Blend</td>
<td>Commercial sod producers</td>
<td>Fast establishing, exceptional dark green color, shade tolerant, superior disease resistance.</td>
</tr>
<tr>
<td>Special Park Mix</td>
<td>Parks, commercial developments, lawns</td>
<td>Low fertility tolerance, shade tolerant, adapts to wide range of soil types.</td>
</tr>
</tbody>
</table>

Ask your Northrup King distributor about the Medalist Turf Products for your needs. Or write Northrup King Medalist Turf Products, P.O. Box 959, Minneapolis, MN 55440.
Mower Wounds
KILL TREES

Seemingly small bumps or scrapes by mowers can cause severe damage to valuable shade trees. Operators need to understand what mower injuries do.

by Terry A. Tattar, Associate Professor of Plant Pathology, University of Massachusetts, Amherst, and Alex L. Shigo, Chief Scientist, Forestry Science Laboratory, USDA Forest Service, Durham, N.H.

One golf course superintendent in New York, frustrated over continued wounding of trees despite his repeated warning, laid off the entire mowing crew for a day. He no longer has serious tree wound problems from lawnmowers.

Lawnmowers are often operated by people with little or no training in arboriculture. They do not understand injury and infection started by lawnmower wounds can often be the most serious threat to tree health on golf courses, parks, and other landscapes.

Most arborists and tree pathologists have been aware of the lawnmower problem for some time. Extensive research has been conducted on the importance of wounds in tree health care (Shigo 1977, 1979). This research has led to significant adjustments in pruning, cabling, bracing, injection, and cavity treatment (Shigo 1982).

Despite this knowledge, one major source of wounds, lawnmowers, remains a constant threat to tree health care (Tattar, 1978).

Lawnmowers cause the most severe injury during periods when tree bark is most likely to "slip", in early spring during leaf emergence and in early fall during leaf drop. If the bark slips, a large wound is produced from even minor injuries.

Most tree injuries occur when mower operators attempt to trim grass around trunks with a push or riding mower. This can be prevented by removal of turf around trees or hand trimming.

The site of injury is usually the root buttress, since it flares out from the trunk and gets in the path of the mower. However, injury is also common anywhere from the roots to several feet above the ground.

Although large wounds are most serious, repeated small wounds can also add up to trouble.

Wounds from lawnmowers are serious enough by themselves, but the wounded tree must also protect itself from pathogens that invade the wound. These microorganisms can often attack the injured bark and invade the adjacent healthy tissues, greatly enlarging the affected area. Sometimes, trees can be completely girdled from microbial attack following lawnmower wounds.

Decay fungi also become active on the wound surface and structural deterioration of the woody tissues beneath the wound will often occur. Many wounded trees which are not girdled may eventually break off at the stem or root collar due to internal decay.
Now All of the top 10 golf courses in America have Toro irrigation

There are some good reasons WHY!

Toro irrigates all of America's top 10 golf courses... 17 of the top 20... 34 of the top 50. That's because irrigation probably is the most important single factor in turfgrass management, and most of those responsible realize that Toro offers them a hard-to-beat combination of expert knowledge and advanced-design equipment. Whether you're planning a new course, replacing your existing system, or trying to solve specific problem areas, a good partner to team up with is the man from Toro!

The Toro Company, Irrigation Division
Dept. WT-484, P.O. Box 489, Riverside, CA 92502

Circle No. 153 on Reader Inquiry Card
What makes a Cushman Front Line™ worth the investment:

The world's most dependable 18-hp engine with new clean air induction system and... a fully integrated power train. No mower can match it for price or performance.

Cushman believes there are no excuses for a mower that can't handle a full day's work. So we build every Front Line with this objective in mind.

**New clean-air induction.**

The Front Line OMC engine is designed for industrial use and has several added features that make it better suited for the grass mowing industry.

Our new clean-air induction system represents a significant improvement in our Front Line mowers. This new system filters the air passing over the cylinders... cooling fins stay clean and the engine will not overheat due to lack of cooling air.

A horn and light warning system also prevent engine damage by alerting the operator to potential overheating conditions. A remote oil filler keeps the engine compartment clean.

**Engineered for performance.**

The Front Line is the industry's only mower whose every component was specifically engineered to fully integrate the power train... for years of dependable service.

The OMC 18 horsepower engine is a perfect match for the Front Line mower with the direct drive power train. There is plenty of power available to produce a fine cut with either side or rear discharge decks.

A hydrostatic transmission that gives the driver complete control via a rocking foot pedal.

A heavy-duty differential; a fully lubricated and sealed PTO shaft; and a high-capacity gear box—all engineered for virtually maintenance-free operation.

And that's just the beginning.

**Built to last.**

The Front Line is 1300 pounds of state of the art engineering.

Its mowing deck is 12-gauge carbon steel, reinforced, arc-welded and surrounded by a tubular torsion system that prevents twisting.

Underneath are 3 blades of machine-sharpened, hot-formed, heat treated steel.

The floorboard is diamond-plate steel. And the 6-gallon fuel tank is made of terneplated steel.

**Built for results.**

A combination of three overlapping blades and the housing design produce the finest cut in the industry.

Dual traction assist pedals give the operator a tight, zero turning radius.

Springs transfer much of the deck weight to the tractor, producing smoother cutting and additional traction on any terrain.

And while ordinary mowers often "bottom out" over hills and bumps, your Front Line may be equipped with an anti-scalp roller option that keeps the cut clean and even.

**The choice is yours.**

Not only is the Front Line mower rugged, it's also versatile.

Add the new Cushman Grass Caddy™, and you'll be able to cut, catch and hydraulically dump 16 bushels of clippings without leaving the driver's seat.

Attach the Snow Thrower or Rotary Broom accessories, and you'll have a vehicle that earns its keep year 'round.

Choose between a 60" or 72" cutting swath. Substitute diesel power for gas. Or shut out the elements with a weathertight cab.

With so many options, your Front Line can be just about anything you'd want it to be.

**A free demonstration.**

Of course, the best way for you to learn about the Cushman Front Line is to see it in action.

On your grounds.

To do that, just return our coupon today. Or call us toll-free,

1-800-228-4444.
When you mix Blazon™ Spray Pattern Indicator with herbicides, fungicides, insecticides, and liquid fertilizers, you can see exactly where you've sprayed, helping to prevent costly overlap and/or missed areas. The color pattern is temporary and dissipates with rain, heavy dew, normal sprinkling, or even with sunlight alone. You'll be able to apply a uniform spray everywhere your tank sprayer or tractor goes, including areas around bunkers and across contours and hills. And while Blazon itself is environmentally safe and does not permanently stain hands, clothing, or equipment, it lets you know exactly where potentially harmful chemicals are. Best of all, you're turning an educated guess into an applied science, making for a better golf course and a better-looking bottom line. For further information, contact Milliken Chemical, P.O. Box 817, Inman, South Carolina 29349, 800-845-8802.