Dedoes...When it has to be right!

When your job depends on fast, effective aeration - you can depend on Dedoes. Whatever make your tractor or cart is, and whatever the application . . . chances are that Dedoes has just the right aerator for you! They're tough, low maintenance products that provide high quality, speedy aeration. The unique aerating drums feature Dedoes patented hinged fins which assure positive, clean penetration and removal of plugs in one pass with no damage to lawns. As the drum rolls, the plugs fall into the drum where they can be collected. Other quality Dedoes grounds maintenance products include such affordable items as our Sand Pro Plow and our versatile Trap Sprayer (both shown above). If you're responsible for strong, healthy grass - call us direct today - we can help!

Dedoes INDUSTRIES INCORPORATED

Grounds Maintenance Division

1060 W. West Maple Rd., Box 575 • Walled Lake, MI 48088

CALL DIRECT 800-521-7086

Circle No. 114 on Reader Inquiry Card
Bentgrasses have been utilized in American turf since the late Nineteenth Century. Native to Eurasia, the bentgrasses were widely distributed by European colonists and first commercialized by English seed companies. Early use was for “wetlands” pastures, followed by golf courses and lawns.

The genus Agrostis, according to Hitchcock's Manual of Grasses, consists of approximately 200 species plus many subspecies. Although each is quite heterogeneous (mixed morphological types from seed propagation) there are four commonly accepted as turfgrass types:

1. Agrostis Palustris — creeping bent grass
2. A. canina — velvet bent
3. A. tenuis — colonial bent

Origin and types
Creeping Bent: A mixed species type known as South German Bent was first available for sowing of putting greens in the late 1800's. It was harvested from moist soil pastures in present day Austria and Hungary, and later from other areas of Europe.

South German consisted of varying proportions of the four above mentioned species and probably their natural hybrids. Resulting greens turf quickly segregated into predominating patches of individual creeping bents and velvet bent to a lesser extent in more favorable temperate climates.

In the absence of pesticides and turfgrass technology, or until the 1930's, much attention was devoted to the more vigorous and better appearing patches. Vegetative selection and propagation began in the 1920's with the initiation of the USGA Green Section research program at the Arlington Turf Gardens. Similar efforts were practiced by early greenkeepers in their then-secretive methods to practice their trade by themselves.

The C Series—Although many hundreds of segregates were selected and propagated for turf, including over 200 in the “C” series of the USGA, only a handful managed to pass the ravages of nature and man. Among the best were Toronto (C-15) which proved best adapted in the midwest, Cohansey (C-7) with better heat tolerance, Washington (C-50) east of the Great Lakes, Arlington (C-1) and Congressional (C-19) in the mid-Atlantic region, and Old Orchard (C-52) for the upper Midwest. Many others were propagated and used to a lesser extent.

The evolution and use of vegetative bents as single genetic types has continued on page 76.

The Bent Grasses

by J.M. Duich, Ph.D., Pennsylvania State University, State College, PA

Segregation into patches happens quickly with South German Bent.

August blotches on Poa annua/bentgrass fairway under level management.
Manhattan II
...it's a whole new ball game!

The professionals who maintain athletic fields have made Manhattan the standard for hard use turf areas.

The best has now become better. Years of cooperative research by New Jersey Agricultural Experimental Station and Pure Seed Testing, Inc. have gone into the development of Manhattan II. The results are darker green color and finer leaf texture than Manhattan. Manhattan II provides good heat and drought tolerance, good shade adaptation and excellent spring greenup.

Manhattan II establishes quickly and has better mowability than our old standard. With brown patch and crown rust resistance, Manhattan II is the ideal surface for work or play.

Manhattan II ... we've improved everything about it, including the price!

Qualified turf associations can earn cash for turf research by saving Manhattan II blue tags.

Contact your dealer for details.
You're responsible for a course worth millions. Sod webworms should be the least of your worries.

What's it going to be this year? The usual sod webworms, billbugs, chinchbugs and grubs? Or perhaps nasty surprises like armyworms or cutworms?

As if this time of year isn't busy enough without insect problems, that's when they hit you.

SEVIN® brand SL carbaryl insecticide hits them back. Hard.

Without clogged nozzles or tank-mix problems. Without corroding equipment. And without protective gloves or masks.

As a water-based sprayable formulation, SEVIN® brand SL is easy to handle, mix and dispose of. So with the time available for application, you spend more time spraying. Less time re-filling.

Tried, tested, trusted

SEVIN® brand SL carbaryl liquid effectively controls over 25 common turf insects, including sod webworms, white grubs, chinchbugs, billbugs, crickets, even ants, ticks and fleas.

SEVIN® brand carbaryl kills insects on contact as well as by ingestion. So you get extended residual action whether pests are feeding or not. And SEVIN® brand carbaryl gives you the peace of mind that comes from knowing it's used for insect control on pets, poultry and even some game birds.

So it's ideal for insect control in golf courses, parks, and other recreational turf areas used by people.

In fact, you can put greens, fairways and other golf course areas treated with SEVIN® brand SL back into play as soon as the spray is dry.

You keep more turf area in use. And to the people who play your course, that's important.

Dependable SEVIN® brand

SEVIN® brand carbaryl is biodegradable in the environment. And there's no harsh odor to annoy players.

SEVIN® brand carbaryl insecticide is registered not just for turf but also trees, shrubs, and flowers. So you don't need to keep track of a large inventory of different insecticides.

Ask your turf chemicals supplier about SEVIN® brand SL carbaryl insecticide. It can help put your pest problems into perspective.

From the turf care group at Union Carbide

Always read and follow instructions on label © 1984 Union Carbide Agricultural Products Company, Inc. SEVIN® Brand Carbaryl Insecticide is a registered trademark of Union Carbide.
proven such narrow genotypes cannot long survive in pure form as most recently evidenced by the devastating "bacterial decline" of Toronto bent. Apomictic bluegrasses (genetically uniform) since the advent of Merion bluegrass in 1950 show a similar relapse over time and area to those who monitor the turf scene.

Apomictic bluegrasses (genetically uniform) since the advent of Merion bluegrass in 1950 show a similar relapse over time and area to those who monitor the turf scene.

Seaside—The discovery and seed harvest of creeping bent growing in tidal flatlands pastures near Coos Bay, Oregon, in the late 1920's resulted in the first domestic source of creeping bent. Known originally as Coos or Cocoos bent, Seaside has since been commercially available, but many locations and generations removed from the original.

Seaside use increased with the need for a seeded type to repair deteriorated or damaged vegetative greens. Except for a "synthetic" S. German composed of mixing domestic species of bent, Seaside was the only seeded creeping bent available for over three decades.

Penncross—The first seeded creeping bent bred specifically for turf, Penncross, became commercially available in 1956. Its availability coincided with the major northern golf course construction boom which lasted until the early 1970's. During this period, Penncross was used on over 90% of newly constructed courses.

Penncross use increased due to its ability to compete most favorably with Poa annua. Secondly, expanded use demonstrated its adaptation to be the widest of any cool-season grass variety. Finally, in conjunction with improved soil modification techniques, the development of fungicides for Pythium, and overall improved management technology, Penncross use extended further and further into the South.

Southern use increased due to a cycle of winterkill of hybrid bermudas and a desire to eliminate the need for winter overseeding. Recent Penncross greens established in the deep south, especially Florida, shall warrant close attention relating to species adaptation and turf management skills.

Penneagle—Penneagle creeping bent (1978) was developed from four advanced generation selections, two each, from Washington and Seaside bents. Penneagle was bred for putting-green-quality upright growth, and vigor to compete with Poa annua, although curtailed compared to Penncross. Its use is increasing, particularly in northern areas for fairways.

Emerald and Prominent—Emerald (Smargd) from Sweden and Prominent from Holland have been commercially available in limited quantities in recent years. Their performance at today's close heights of cut (approximately 1/8-inch) have yet to be proven. Ten year tests at Penn State show both to segregate and unable to compete with Poa annua.

Compared to other species, experimental work with creeping bentgrasses is quite limited. Bent improvement for fairways is underway at Rutgers, as well as improved winter-hardy types in Canada. At Penn State, PSU-126 has been distributed to over 100 golf courses in 30 states, Canada and S. Africa. Pending continuing favorable performance, this upright growing creeping bent may become commercially available in 1986.

Velvet Bent: Since its introduction as a component of South German bent, velvet bent attracted attention due to its very dense and fine-textured foliage. Adaptation has been found as best suited to maritime climates, such as upper New England. Velvet bents are tolerant of acid soils and shade. Upon establishment they must be sparsely fertilized with nitrogen to avoid thatching and sponginess. Former types such as Piper, Raritan Kernwood and various local types are no longer commercially available. Limited seed quantities of Kingstown, a University of Rhode Island release, are being produced.

Colonial Bent: Allegedly bunch types, colonial bents are tolerant of mowing under one-inch. Diverse growth habit types include those with short stolons and/or rhizomes. Upon
NO OTHER HERBICIDE COVERS THE LANDSCAPE LIKE CHIPCO RONSTAR.

RONSTAR GIVES EXCELLENT WEED CONTROL.

Just one application of RONSTAR herbicide gives effective, season-long control of over twenty of your toughest annual broadleaf and grassy weeds.

FOR A GOOD-LOOKING LANDSCAPE, TAKE A GOOD LOOK AT RONSTAR HERBICIDE.

If you'd like to find a simpler, safer way to keep weeds under control, find out more about the preemergence herbicide that covers the landscape: CHIPCO RONSTAR herbicide.

See your dealer, or write: Rhône-Poulenc Inc., Agrochemical Division, Monmouth Junction, NJ 08852.

RONSTAR SPREAD THE WORD.

Please read the label carefully, and use only as directed.

IT'S SAFE ON THE BROADEST RANGE OF TURF AND ORNAMENTALS.

You have to be careful when you put down most pre-emergence herbicides. They're safe on turf or ornamentals. Not on both.

Enter CHIPCO® RONSTAR® preemergence herbicide. The only product you can use safely to weed the whole landscape: turf, woody ornamentals, ground cover, and trees.

RONSTAR herbicide solves a lot of problems. And simplifies your inventory and application. It causes no root pruning. Needs no incorporation. Won't leach or move into untreated areas.

Circle No. 148 on Reader Inquiry Card
being introduced from Europe, the colonial bents have always been identified as ecotypes based on their areas of initial naturalization.

New Zealand Browntop, Prince Edward Island and Rhode Island Colonial were among the earliest "varieties" commercialized. Since the mid-1930's, the Oregon production of Highland and Astoria bents has prevailed. Highland production exceeds all other bentgrasses ten-fold!

Colonial bents were a common mixture component with Kentucky bluegrass and fine leaved fescues for many years prior to the advent of improved varieties. Their general use for this purpose rapidly declined as turf use expanded and the colonials dominated turf stands.

Musser and Duich evaluated the growth habit of 54 colonial bents in 1954. We found 44 of 45 domestic seed lots to contain from 3 to 51 percent stoloniferous types. One domestic and nine New Zealand types contained no stolons.

The main turf use of colonial bents in the U.S. has been for golf fairways beginning with the introduction of irrigation in the 1930's. Use increased in the late 40's as shorter heights of cut plus irrigation eliminated bluegrasses and fescues.

During this period, colonial bents were found to be susceptible to many diseases, i.e. brownpatch, pythium, snowmolds, dollar spot, leafspots and others. Disease problems led to initial fungicide spraying of fairways in the early 1950's. By necessity, fungicide applications became a near weekly practice for some. However, foremost among problems with the culture of colonial bents has been the dominance of invading Poa annua.

Variatel improvement has been limited to the non-creeping Exeter, Holfior, and Bardot cultivars. The dominance of lower cost Highland has curtailed consumer interest in these varieties. An extensive program to develop rhizomatous colonial bents is under way at Penn State.

Redtop Bent: Quick germination and seedling growth were virtues for early use of Redtop in turf seed mixtures. However, the overuse of this small seeded grass led to its dominance of new turf stands. As a short-lived perennial, stands quickly deteriorated except for longer lasting rhizome types which are considered weeds. The introduction of turf-type perennial ryegrasses has practically eliminated Redtop as a turfgrass.

**Management trends**

A major fallacy concerning bentgrasses, particularly the creeping, is that they require high levels of nitrogen, in particular, and water.

For years, texts, articles, and advertisements have stated bent greens need 1 to 1/2 pounds N per month of growing season, tees higher yet, and fairways of approximately half these rates. Those utilizing such programs have had to cope with nothing but excesses: mowing, clippings, thatch, puffiness, scalping, grain, aeration, verticutting, spraying, continued on page 104
The 'Penn Pals' have proven their performance on tees, greens and fairways in all parts of the globe.

**Penncross**
- Heat tolerant
- Disease resistant
- Fast growing
- Wear tolerant
- Aggressively competes with Poa Annua
- The worldwide standard for more than 25 years

**Penneagle**
- Upright dense growth
- Dark green colour
- Lower cutting (3 MM for tournament play)
- Fast germinating
- Dollar spot resistant

**'Penn Pals'**

For more information or the name of your distributor call or write

**Tee-2-Green Corp.**
In the U.S.A., toll free 1-800-547-0255
In Oregon, 981-9574

Warren Bidwell, turf consultant, is available to talk to your superintendents group about golf courses around the world. Call Tee-2-Green Corp. for details.
The trick to selecting trees for golf courses is matching their biology with existing conditions on the course. That match has been well developed by horticulturists and ecologists.

A plant management approach would stress that certain trees tolerate and even thrive under difficult conditions while others either die or require intensive maintenance.

Four groups of trees are well-suited for use on golf courses. It is particularly important to recognize that all of these groups of trees will grow under the most favorable conditions but, as oxygen becomes more limiting, fewer trees will tolerate adverse conditions. Groups 1 and 2 will grow under all conditions; Group 3, fewer adverse conditions; and Group 4 will require the most favorable environmental conditions.

**Group One: Low Oxygen, Wet Soils**

Trees under average golf course conditions must often tolerate low oxygen soils and some flooding. In nature, they frequently grow in swamps and along lake shores or streams. These trees are best separated into two subgroups; those requiring full sun and those preferring shade.

Full sun trees will take flooding and tolerate low oxygen soils but must receive full sun. These are essentially classified ecologically as intolerant species. (See Tables)

Trees which grow in low oxygen soils, yet perform best in shady conditions, are less numerous. They are frequently swamp plants that grow in either shade or full sun. The key is these understory or specimen plants will grow in heavier soils where other trees might require extensive drainage.

A little planning and research on appropriate trees for your golf course can offer big time and money dividends in the long run.

**Trees for Golf Courses**

by Douglas Chapman, horticulturist-administrator, Dow Gardens, Midland, MI

*Celtis occidentalis*, common hackberry, is a tree that requires well drained, fertile soil and is good for intensely maintained areas.