

Here are some close looks at Wright's spray equipment. His spray unit is made by the Minnesota-Wanner Company and is powered by a 9 h.p. Briggs Stratton engine. His pump is rated at 20 gpm at 1,000 psi. The lower pictures show what kind of spray pattern he gets from his broadcast tip. His jeep units are equipped to do either hand or boom work. The picture at right shows the value of a "front-view" mirror. From the driver's seat, Wright can watch the operation of the front-mounted boom, noting stoppages immediately. Without the mirror, Wright, said, it would be possible to travel quite a distance without knowing no herbicide was being applied.





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crew.**

(Balan™)—benefin, Elanco  
(Treflan®)—trifluralin, Elanco  
(Dymid®)—diphenamid, Elanco



Preliminary rough grading of the Graeagle Meadows golf course greens and tees involved spreading fir bark four inches deep over a 14-inch layer of washed sand. The bark replaces peat.



The sand-bark process calls for rotovating the sand and bark to a two-to-one mixture for a depth of eight inches. The construction method was developed by landscape architect Ellis Van Gorder.

## California Course Builds

# Sand/Bark Greens And Tees

**G**RAEAGLE Meadows, a recently completed 6,700-yard, 18-hole championship golf course in the heart of the Sierras in Graeagle, Calif., boasts a new method of tee and green construction.

Ellis Van Gorder, golf course architect, who designed the course, which averages 4,800 feet above sea level, calls the process "Sand and Bark" construction. The process is unique, he says, because fir bark "fines" are used in place of conventional peat.

According to Van Gorder, the process is faster and saves labor costs. The technique results in a more uniform surface, makes possible more even mixing of ingredients, and because of the product's excellent water retention value, results in more uniform seed germination. Because the bark is weed-free, the customary maintenance problem is almost completely eliminated.

Although Van Gorder has used the method before on such projects as Makaba Golf Course in Hawaii, and Peacock Gap Golf Course in San Rafael, Calif., he said the technique is not well-known.

"Primary shaping and contouring is done using existing soil," Van Gorder explained. "Normal care is given to promote proper drainage to avoid impounding water areas. Clean sharp sand is then laid on to a depth of 14" and rough-graded to the specifications of each putting surface. If an overabundance of silt is present, then washed sand would be desirable. A 4" layer of 3/8" fine fir bark is then spread over the entire putting surface. This is done with a conventional scraper and

rough-graded again to the contour of the final green.

"The combination of bark and sand is then rotovated to a depth of 8" using extreme care to get a uniform mix. Each 4,500-square-foot green requires about 70 yards of bark. After rotovating, the surface is tractor-graded and rolled to final contour, then raked and dragged by hand to the final putting surface.

"Greens are then seeded 2 1/2 pounds per thousand square feet with a high-grade, weed-free seed mixed with a 10-10-10 combination of fertilizer (10 lbs. per thousand square feet) and 20 pounds of milorganite.

"The area is rolled again then kept moist during the entire germination process, from 14 to 21 days, depending on climate and atmosphere."

Van Gorder emphasized one advantage of fir bark at this stage. Because of the material's inherent water retention, he noted, bark is easier to keep moist, requiring fewer hours of watering. Because of the texture and bulk of the bark, compacting does not occur until well into the germination period. Although Graeagle has an ample and economical supply of water, this feature is particularly important in areas where water is expensive or in short supply.

Carl DellAquila, contour landscape grader, who has engineered such projects as the Palo Alto Muni Golf Course, Peacock Gap Country Club and Palo Alto Hills Golf Club, and the contour grader at Graeagle Meadows, cited some side ben-



Harvey West, Jr. (right), developer of Graeagle, a vacation and retirement home community in Plumas County, California, discusses the sand-bark turf construction method with Carl Dell Aquila, contour grader.



Rolling is accomplished with this equipment. The 18-hole championship golf course winds around a natural pine forest at an elevation of 4,800 feet.



Just prior to seeding, the greens and tees are hand-raked. Note the even texture and uniform pattern, a condition difficult to obtain with peat-type products.

efits on the sand-bark process. "One obvious benefit" he said, "is that we can tractor-grade the bark throughout the entire process. With peat, it's strictly 'by hand.' Peat bunches up under the blade and it's almost impossible to get a uniform texture unless you mix and fill completely by hand, through

'off site' mixing method. "This sand-bark method obviously saves time but it also gives a better surface with less raking and dragging by hand."

While bark used at Graeagle was obtained locally at the Feather River Lumber Company, in Loyalton, Calif., the company plans to mar-

ket the product nationwide, in both bag and bulk quantities. It will be handled through the special products division of the R. F. Nikkel Lumber Company, Sacramento, Calif. Nikkel also plans to market a line of bagged "decorative" fir bark products for sale through retail outlets and nurseries.

## THE ONE FOR MANY JOBS...



GOLF COURSE



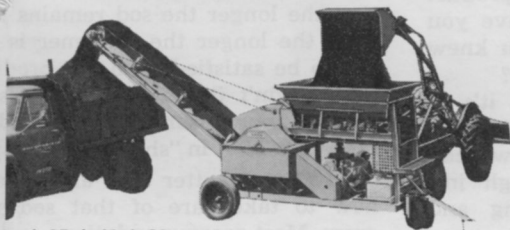
SEWAGE SLUDGE



GREENHOUSE



ATHLETIC FIELD



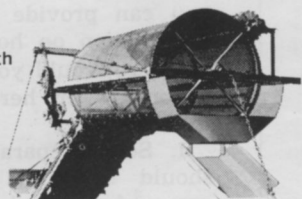
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HOLFIOR BENT

PENNCROSS BENT



A new variety of Colonial Bentgrass reported to be as easily managed as bluegrasses is being introduced for golf course use by Northrup, King & Co.

Called HOLFIOR Bentgrass, the new variety has been undergoing tests by Northrup King since 1956 and is said to produce a turf of uniform color and texture over the entire fairway. It is recommended also for use on aprons and tees, but not on greens.

According to Howard Kaerwer, chief turf agronomist at Northrup King, HOLFIOR produces plants of leafy, dense and upright growth that do not segregate for color, texture, leaf width or growth characteristics. Golfers reportedly like the firm, upright support it gives the ball.

HOLFIOR thrives with only the moderate amounts of fertilization and irrigation required by bluegrasses. Intensive disease control measures are needed infrequently; it is resistant to snow mold and only moderately susceptible to Dollarspot.

Said to be the fastest-establishing bentgrass available, HOLFIOR also mows clean without matting or tufting. It can be mowed at any height from 1/4" to 1 3/4".

HOLFIOR adapts well to varying conditions of soil and moisture, and is compatible with the new short-cut bluegrasses (Prato, Fylking, Pennstar). For more details, circle (713) on reply card.

# Tell 'em How to Grow *YOUR* Sod

By Gene Ingalsbe

*A purchaser of cultivated sod should get an "owner's manual."*

Let's think about it.

Suppose you bought an automobile, tractor, or major appliance and weren't provided an owner's manual covering maintenance and operating instructions. The first time something went wrong and you

didn't know why or didn't know what to do, who would you blame? The manufacturer, of course.

Isn't it possible that the reaction may be the same when the product is sod? How many times have you had to replace sod when you knew your product wasn't at fault?

Turf specialists know that it's as easy to burn up a lawn as it is to burn up an engine; that a lawn can become as "sluggish" through improper fertilization, watering and

mowing, through weed infestation or disease as can an engine without proper maintenance.

Most cultivated sod is near perfect upon delivery. It just makes sense that the longer the sod remains that way, the longer the customer is going to be satisfied with the product. So wouldn't it be good business to tell the purchaser of your product how to keep it in "showroom" shape?

You know better than anyone else how to take care of that sod you grew. Most recommendations on turf care are necessarily general. Since sod is usually marketed within a 100-mile radius of where it is grown, you can provide the most precise information on how to care for it.

Where would you begin? Well, as a homeowner, here's what I would like to know:

1. Soil Preparation. What steps should be taken to prepare the ground for receiving the sod? Should I attempt to eliminate weeds, cultivate, fertilize?

2. Breaking-In Instructions. Exactly how should I water the new sod? When should I first mow it?

## AMERICAN SOD PRODUCERS ASSOCIATION invites your participation

If you are a Sod Grower you should be  
a member of ASPA.

Keep in touch with progress.  
Allied Industries are welcome.

For More Details Circle (104) on Reply Card

What height? When should I first fertilize?

3. Mowing Instructions. How can mowing practices affect the health of my lawn? When should I mow? What height? How often? What do I do if I scalp a spot?

4. Fertilization. Give me a year-around program to follow.

5. Disease. Tell me what disease my sod is most susceptible to, when disease is most likely to occur, what the symptoms are, what curative measures I can take.

6. Weeds. What weeds are most likely to crop up? When? What weed killers are available to correct the problem? How do I apply the weed killers and at what rates?

7. Watering. How can watering practices affect the health of my lawn? When should I water? How much?

Instructions of this nature can be as detailed as the producer of the turf wishes. He could provide specific maintenance instructions for each variety he sells. The format might be simply an instructional leaflet, or a more complete, polished booklet that could double as a merchandising tool.

Dr. Henry Indyk, executive secretary of the American Sod Producers Association, predicts that the sod industry will continue to expand, but that demand may have to be cultivated. A grower will stay in the business only if he keeps up to date, he believes.

Success of some of the newer sod varieties may very well be determined by how well informed the buyer is concerning its maintenance. If not for this reason, then competition alone may produce a turf owner's manual.



"You've got weeds in your turf, Harry."

## Try These Tips on Using Dicamba and Mecoprop

Broadleaf weeds in turf ought to be as archaic as the Model T Ford, exclaimed Dr. Edward W. Stroube at the recent Ohio Turfgrass Conference.

Good turf management practices should all but eliminate weeds, said the Ohio State agronomist, but should some appear, there's a herbicide to quickly take care of the culprit. Uniform and timely applications are necessary, however.

"Most weeds are more susceptible when there is good soil moisture and when the weeds are growing rapidly," he said. "They become more resistant when they become semi-dormant due to dry soil or as they approach maturity."

Herbicides recommended for broadleaf weed control are intended for turf areas only, Dr. Stroube reminded. Indiscriminate use can bring injury to flowers, trees, ornamentals and gardens. He advised that, if sprayed, the compounds should be applied at low pressure and during periods of little or no wind.

"Dicamba (Banvel) should not be used under desirable plantings, as root absorption by these plants may result in injury," he warned.

Herbicides should not be used on newly seeded turf unless weeds pose a greater danger, Dr. Stroube said. It has been reported, he added, that the relatively new herbicide, bromoxynil, is safe to use on seedling broadleaf weeds in newly established turf.

For states with climate similar to Ohio's, Dr. Stroube offers his recommendations in Table 1 for controlling some of the more common weeds that appear in turf.

Lee Record, agronomist for the United States Golf Association offered advice on using the systemic herbicides, Dicamba and Mecoprop (MCP).

The two will effectively control knotweed, clover, common chickweed and mouse ear chickweed. Formulated with 2,4-D, they will control dandelion, plantain and pigweed.

Systemic herbicides make use of

physiological differences of plants for selectivity, Record explained. Dicamba and Mecoprop applied to leaves penetrate the cuticle and stomata, translocating to the food or water conducting tissue and then to other parts of the plant.

Pattern of translocation is influenced by the kind and stage and growth of the plant, Record said.

"Sometimes, the herbicide is absorbed and inactivated by cells in the leaf," he said, "and sometimes it may remain on the leaf surface and never enter the plant."

Soil relationships to the herbicide, temperature and moisture have been

# KEEP AMERICA BEAUTIFUL



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## RAPID-GRO

For More Details Circle (105) on Reply Card

recognized as important factors in the effectiveness of weed control programs, he said.

"Optimum conditions for weed control when using Dicamba and Mecoprop would be to have adequate soil moisture and temperatures between 70 and 75 degrees.

"We have seen on numerous occasions the importance of having adequate water as a carrier for Dicamba or Mecoprop. One-half to three-quarters pound of actual material

applied in 40 to 50 gallons of water per acre will give excellent results.

"The same rate of actual material in 20 gallons of water per acre will give very poor results.

"We have found that Dicamba and Mecoprop have a wide margin of safety when used intelligently. Repeated applications from year to year, on the other hand, have shown thinning of bentgrass and bluegrass. Complete kill has been noted on turf when herbicides were misused."

TABLE I. HERBICIDE RECOMMENDATIONS

Weed	Annual or Perennial	to Use Chemical	Time of Application	Degree of Control
Black medic	annual	silvex or dicamba	early spring	good
Chickweed, common	annual	silvex, MCPP or dicamba	spring or fall	good
Chickweed, mouse ear	perennial	silvex, MCPP or dicamba	spring or fall	good
Chicory	perennial	2,4-D or silvex	spring	good
Dandelion	perennial	2,4-D or MCPP	spring or fall	good
Dock, curly	perennial	2,4-D or dicamba	spring or fall	good
Garlic or onion	perennial	2,4-D ester or dicamba	early spring late fall	fair
Ground Ivy	perennial	silvex or MCPP	spring, summer or fall	fair to good
Heal-all	perennial	2,4-D	spring	good
Henbit	annual	silvex	spring	good
Knotweed	annual	2,4-D or MCPP	spring	fair
Mallow, roundleaf	annual	silvex	spring	fair
Plantain, buckhorn	perennial	2,4-D or MCPP	spring or fall	good
Plantain, common	perennial	2,4-D or MCPP	spring or fall	good
Poison ivy	perennial	2,4,5-T or silvex	spring or summer	good
Red sorrel	perennial	dicamba	spring, summer or fall	good
Speedwell, thyme-leaved	perennial	dicamba or endothall	spring or fall	fair
Speedwell, annual	annual	dicamba or endothall	spring or fall	fair to good
Spurge, spotted	annual	silvex or dicamba	spring	good
Thistle	perennial or biennial	2,4-D or dicamba	spring or fall	fair to good
White clover	perennial	silvex, MCPP	spring, summer or fall	good
Wood sorrel	annual	silvex or dicamba	spring	fair to good
Yarrow	perennial	dicamba	spring or fall	fair to good

## World Pesticide Symposium Set at MSU for Feb. 25-27

Six hundred of the world's top researchers will convene for a pesticide symposium and the dedication of Michigan State University's Pesticide Research Center, Feb. 25-27, at East Lansing.

Speakers and topics have been confirmed for the "Symposium on Pesticides in Soil: Ecology, Degradation and Movement," according to Dr. Gordon E. Guyer, chairman of MSU's entomology department and director of the Pesticide Research Center.

The symposium will be keynoted by J. Van der Drift, soil biologist from the Netherlands and summarized by Dr. L. J. Audus of the University of London.

Presenting research papers during the meeting will be scientists from Germany, Canada, England and the United States.

A tour of MSU's new Pesticide Research Center will be conducted Thursday afternoon, Feb. 26, and the center will be officially dedicated that evening.

"The symposium is built around this interdisciplinary approach to research," said Dr. Guyer. "Scientists will report on the effects of pesticides on our environment and the latest efforts to reduce pesticide residues."

## Central Chemical Forms Turf Products Division

Central Chemical Corporation, Hagerstown, Md., has formed a turf products division.

President Franklin M. Thomas, Jr., said the new division's purpose will be to serve the turfgrass industry with selected fertilizers, chemicals and specialties.

George Cassel has been named division manager. Headquarters will be at Central Chemical's Everett, Pa., offices. Cassel, a Penn State graduate, is a 19-year employee in the company's agricultural group.

James M. Edgar, who has been associated with the golf industry, has been hired as the division's first sales specialist.

**MARCH:  
IRRIGATION ISSUE**



## Florida, Michigan Leading In Golf Course Construction

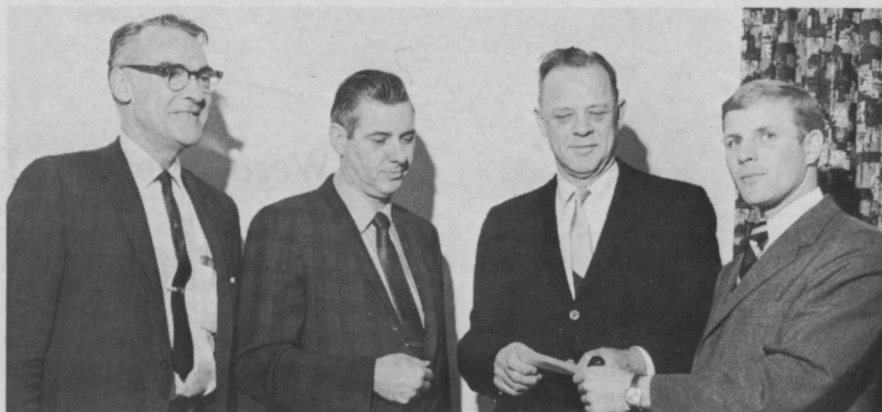
With the picture ever-changing, there were at year's end 439 golf facilities under construction throughout the country, reports Harry Eckhoff, facility development consultant for the National Golf Foundation.

Eckhoff authored the golf industry outlook for the coming year in the December issue.

Of the new facilities, Eckhoff reported, 381 are regulation courses and 58 are par threes and executive type.

States leading in new golf course construction are: Florida, 30; Michigan, 25; Illinois and Pennsylvania, each 21; California and Ohio, each 20; North Carolina, 19; Tennessee and Texas, each 18; Virginia, 16; New York, 15; Washington and Indiana, each 14; and Georgia, 12.

Prolonged tight money has brought some changes into financing of golf projects, said Eckhoff. "Many private clubs are selling long-term interest-bearing bonds to their members," he said. "Small syndicates are being created to finance profit-motive golf courses. Some projects are obtaining legal authority to sell stocks on the open market."



Bill Byers, right, president of the Iowa Golf Course Superintendents Association, presents a check for turfgrass research to Floyd Andre, dean of agriculture, Iowa State University. Looking on, from the left, are Ed Cott, ISU Extension horticulturist and turfgrass specialist; and Dr. J. P. Mahlstedt, associate dean of agriculture. The Iowa GCSA has given ISU a research grant annually since 1941.

An example of the stock venture, Eckhoff reported, is the 18-hole Trent Jones designed Golden Triangle Golf Course planned for the 170-acre Johns Hopkins Estate between Baltimore, Md., and Washington, D.C.

Stock offering for this one is under way, according to Carl Rasnic, former PGA Middle Atlantic Section president and now president of Golden Triangle.

A stock offering of four million shares, Eckhoff said, has been announced by American Family Rec-

reation Centers, Inc., of Annapolis. Proceeds will be used to build year-round resorts, including golf courses, motels, travel-trailer parks, swimming pools and other facilities. They'll be located between Kentucky and Florida adjacent to Interstate 75 and from Virginia to Florida adjacent to Interstate 95.

The first two resort sites, Eckhoff continued, are planned (each at a cost of about \$8 million) just south of Atlanta and in the Orlando, Fla., area.

## Insect Report

WTT's compilation of insect problems occurring in turfgrasses, trees, and ornamentals throughout the country.



### TURF INSECTS

#### CHINCH BUG

(*Blissus leucopterus*)

INDIANA: Noneconomic in 23 grass and soil samples in northwest, west-central, northeast, and east-central districts. Averaged 24 per square foot at one location each of Atkinson in Benton County.

#### GRASS WEBWORM

(*Herpetogramma licarsisalis*)

HAWAII: Heavy on turf in park at Mililani, Oahu; larvae and/or pupae 10-12 per square foot.

### INSECTS OF ORNAMENTALS

#### ARMORED SCALES

FLORIDA: Nymphs and adults of *Lepidosaphes maskelli* on 90 percent of 939 *Juniperus chinensis* in nursery at Dover, Hillsborough County. All instars of *Pseudaonidia clavigera* on 100 camellia plants in nursery at Englewood, Charlotte County.

#### BROWN SOFT SCALE

(*Coccus hesperidum*)

CALIFORNIA: Heavy on strawberry trees, *Arbutus unedo*, at Taft, Kern County.

### TREE INSECTS

#### AN APHID

(*Lachnus salignus*)

CALIFORNIA: Heavy on weeping willows locally at Nevada City, Nevada County.

#### (*Essigella pini*)

OKLAHOMA: Continues active on pines at Stillwater, Payne County. Up to 10 per terminal.

#### WESTERN PINE BEETLE

(*Dendroctonus brevicomis*)

CALIFORNIA: Ponderosa and Jeffrey pine trees in Lassen National Forest, struck by lightning, currently show 30+ trees infested in one-half acre area. Salvage of dead and infested trees planned.

#### A RHOPALID BUG

(*Leptocoris rubrolineatus*)

NEVADA: Collected from *Acer negundo* (boxelder) at Mina, Mineral County. This is a new county record.

#### FOREST TENT CATERPILLAR

(*Malacosoma disstria*)

MINNESOTA: Egg masses in northern area checked in November and December 1969: Egg parasitism 3.93 percent, dead prelarvae 0.77 percent, and dead eggs 5.63 percent.

## NE Weed Scientists Told to

# Broadcast Good Side

*"One goal for the 70s must be to communicate the importance, safety and potential of herbicides."*

—Outgoing President  
Dr. Homer LeBaron



*"We need a pulling together of all weed scientists to present a unified approach concerning pesticides."*

—Incoming President  
Dr. John Ahrens

**R**ESPONSIBLE weed scientists can no longer afford to remain silent when some of the "popular ecologists and environmental opportunists" issue "exaggerated or politically motivated claims" about pesticides.

Homer LeBaron of Geigy Agricultural Chemicals Corporation issued this warning and challenge as he opened the 24th annual meeting of the Northeastern Weed Control Conference, Jan. 7-9 in New York City.

Considering how the decisions were made banning the uses of DDT and cyclamates, "politics and emotion, rather than scientific evaluation of data, could control the destiny of a pesticide," he told some 600 weed scientists.

In the more recent attack on 2,4,5-T, he continued, it is impossible to tell which attackers are concerned with environmental quality and which are against the Vietnam war.

Elimination of environmental pollution is one of the announced major commitments of the government for the next decade, LeBaron reminded.

"Most of us in weed science have been motivated by the potential in this field to benefit mankind, to alleviate hunger, to improve the environment. One of our great challenges for the 1970s will be to use herbicides more in the prevention or reduction of environmental pollution, in environmental beautification,

and in conservation of crops, land, labor, and natural resources.

"We are entitled to be proud of our accomplishments."

Recent developments indicate, however, that a credibility gap has opened and that our activities are grossly misunderstood by the general public, LeBaron said.

We have always been aware of the hazards from the misuse of chemicals, he continued. "We have always been in favor of proper balance of the three Rs, 'Research, Reason and Regulations.'

"It is clear that we will be more preoccupied in the next decade with four Ps: Pesticides, Pollution, Politics and Public Relations.

"One of our major goals for the 70s must be to more effectively communicate the importance, safety, and potential of herbicides to mankind."

### Delaney Clause Ought to Go

LeBaron, the outgoing president of the northeastern group, called for an end of the "Delaney clause" in government pesticide regulations, which, he said, had become as impossible to live with as the "no residue" tolerance clause just recently changed.

The Delaney clause states that no food additive shall be deemed safe if it is found to induce cancer when ingested by man or animal.

A more workable safeguard is needed, said LeBaron, because "so many relatively safe compounds can

