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## Limb Lopper



**T**HE Sunnyvale Golf Course, in its fourth year of play, was developed to increase the recreation offered by the Parks and Recreation Department of Sunnyvale, California. Designed by architect Dave Kent, the 6,400-yard course takes advantage of the natural hazards found in the highly industrialized San Francisco Bay area, and provides a much needed oxygen oasis.

The location of this golf course is probably as unique a land use as anywhere in the country. It has a major freeway running through the middle of the course. It has another one running along its east side. The fairways serve as a landing pattern for nearby Moffett Field, a naval air station. Where the highways and airfield permit, the golfer sees only industrial parks and manufacturing plants. And the soil from a worn-out walnut orchard had to be made to grow turf.

But none of this daunted superintendent Dick Viergever when he started construction in 1966. To connect holes 3 through 13 to the clubhouse side of the course, a tunnel was built under the highway. Since the highway and the golf course were being built simultaneously, the highway department included the tunnel in its plans.

The highway department maintains the fence and their side of the right-of-way. The problems on the golf course side have been solved by providing ground cover along the fence and by landscaping to hide the highway and protect drivers from misdirected golf balls. These mechanical and natural barriers also prevent movement of highway vegetation control chemicals onto the highly specialized golf turf. By proper placement of tees, fairways, and greens adjacent to the highway, there is minimum, if any, likelihood of golf balls going over the fences and onto the roadways.

Wind and noise add to the hazards designed into the course. Low flying aircraft increase the golfers' need for concentration. Constant winds from the bay can play havoc with the flight pattern of the golf balls. Part of the old walnut orchard serves as another natural site hazard. The last four holes are built through the low growing trees — only low-growing plant material can be used in landscaping because of the low flying aircraft.

A superintendent since the days the horses pulled the mowers as they fertilized, Dick Viergever knew how to select turfgrass and how to grow it.

Starting with Kentucky bluegrass



## SLOW RELEASE NITROGEN

## Golf Course Labor-Saver

and creeping red Fescue, fairways and tees were established. Fyrling and Windsor have been used for overseeding. The bent greens are Seaside overseeded with Pennncross.

To keep grass in condition for twelve months play in California, the fertilization program is considered as critical as the availability of water. Irrigation equipment was designed into the course, and five lakes were bulldozed to provide year-round reservoirs. Slow-release nitrogen was the fertilizer choice for fairways, greens and tees.

Fairways and tees receive annually 8 to 10 pounds of nitrogen per 1,000 square feet. Under normal conditions, three applications do the job — spring, summer and fall. Two applications are 10 pounds per 1,000 square feet of 38-0-0 ureaform. The third application is 10 pounds per 1,000 square feet of 21-8-8 with two-thirds of the nitrogen from ureaform.

Between May and October, the dry season, fairways and tees are watered three times a week. During the rainy season, irrigation is used only as necessary.

Greens receive annually 14 pounds of nitrogen per 1,000 square feet. A 27-6-10 with two-thirds of the nitrogen from ureaform has been used more than any other fertilizer. Greens are aerified at least twice a year, and Osmocote 21-5-5 has been used successfully with aerification. Under stress conditions, greens, as well as fairways and tees, may receive supplemental soluble nitrogen such as ammonium sulfate.

During the dry months, greens are watered four times a week, and as needed between November and April.

Greens require the proper attention to soil conditions during maintenance as well as during construction. All greens at Sunnyvale Golf Course are topdressed four times a year with a mixture of sand and organic. This not only keeps soil in condition but takes care of thatch by breaking it down and keeps a level putting surface.

With labor costs taking up to 65 percent of budget and equipment 20 percent, mowing practices are rigidly followed to keep bent-grass greens one-quarter inch or less and bluegrass fairways and tees one inch or more.

According to superintendent Dick Viergever, "Another reason the slow-release nitrogen fertilizers are used almost exclusively is to keep down the number of annual applications. This frees the labor force for those jobs chemicals and nature can-

(Continued on page 32)

# Brush Chipper and Stump King vs. Dead Wood

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This is a grove of sweet gum and persimmon near Conway, Arkansas. It's so thick you can hardly walk through it, yet control is nearly 100 percent.



Here's a spray crew on the job out where the big firs grow—the Pacific Northwest. Spraymen are applying Banvel to rid area of smaller trees so that Douglas fir can be replanted.

# Victorious War On Brush

Brush species that have been resistant to previously used herbicides for brush are now succumbing to a relatively new brush control chemical called Banvel.

Produced by Velsicol Chemical Corporation, the product until recently was oriented mainly to agriculture. Within the last two-three years, potential for control of hard-to-kill brush species has developed fast.

"We haven't really found a specie on which Banvel, has not shown activity," says Don Telge, a railroad vegetation control specialist for Velsicol. "In some areas of the country, though, some users find that red maple is a specie that should be watched, in that Banvel sometimes controls it, sometimes not."

It's the difficult species to control, such as ash, hickory and persimmon, where Banvel's results show up most dramatically. Around Oklahoma, blackjack oak is one of the toughest species to control, because of its large root system and hard and waxy leaves. In Alabama, sassafras accounts for an estimated 40 percent of the brush not controlled by other chemicals. In Texas, Louisiana and Alabama, there is a  
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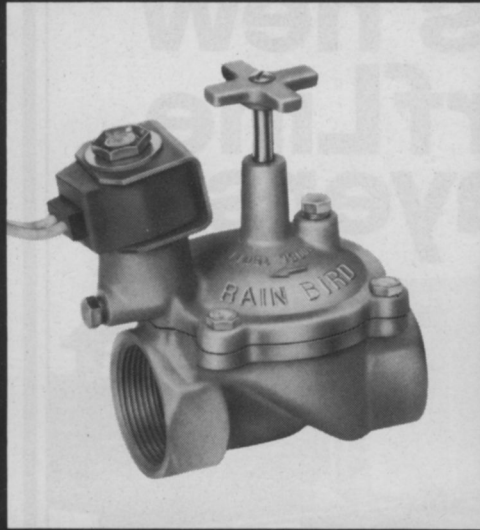


Jack Woods of Public Service Utility, Tulsa, Oklahoma, examines a dead winged elm.



This willow is 35 feet tall. It's dead and so are the vines surrounding it. Banvel controls brush a long time after application. The chemical becomes part of the cell structure.

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## WEED CONTROL (from page 12)

ditches and rights-of-way. They apply a basic 8-foot swath to shoulders and ditch bottoms, but with a two-nozzle fixed boom spray rig controlled from the cab, the spray operator can easily modify the spray pattern to conform to the needs of roadside terrain.

The Pierce County spray rig has two tanks (one holds 500 gallons, the other 250 gallons) and two 100-foot hoses with spray wands, as well as the fixed boom. This provides maximum flexibility in spray applications. Different materials can be carried in these tanks to handle a variety of weed problems and brush problems around bridges and culverts.

Normally, brush control spraying with 2,4-D is started in the spring, but then in the fall Ford's program is focused on alders and blackberries, while the winter spray effort is concentrated on dormant brush control with Tordon. In addition, Pramitrol pellets are used during the growing season for weed and grass control around signs and markers, so cutting crews do not have to be held up by excessive growth near these signs.

"We have made a switch to Krovar I in 1972," reports weed supervisor Ford. "The idea was to control more weeds along the roadside, so our spring treatments would be even more effective than they have been. We usually treat at a 10 to 15 pound rate on road shoulders and drainage ditches that have never received any chemical treatment before, but we use a 7-pound per acre for road sections previously treated. We mix the Krovar I and a quart of 2,4-D in 100 gallons of water and we drive our spray rig at about 10 miles per hour when we are spraying."

Spray operations, Ford notes, are often more economical than hand work. An example is a 400-foot wooden viaduct. It once took a six-man crew a week and a half to clean out brush at the base of this viaduct. Now a two-man spray crew can apply a brush-control compound in a few hours, freeing the other men to tackle other needed road maintenance tasks. The chemical approach provides longer control and protects the viaduct against the hazards of fire by keeping dead weeds and grass out of the area.

Similarly, it often takes a highway crew a full week to clear a typical weed-choked drainage ditch. They need five trucks and a Barton

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# Aquatic Weeds – A National Problem

**I**n a climactic display of roll-call voice voting, members declared the Hyacinth Control Society Inc. to be the official name of the 12-year old organization "for at least another year."

Although a direct mail straw ballot earlier indicated that many members desired to change the name to the Aquatic Weed Science Society, open floor discussion apparently swayed the majority's opinion in favor of the older established name.

Site of this year's July meeting was Miami, and while the sun only partially cooperated, attendees willingly participated in the meeting and the associated fun activities. The unofficial registration count showed an increase over 1971 attendance with over 200 attending.

Unlike other meetings of the Society, this year's convention was attended by a greater number of persons outside the imaginary periphery of serious aquatic weed and vegetation problems. Papers presented by scientists, aquatic weed specialists and industry representatives indicated that concern on controlling aquatic vegetation has reached beyond the "gee-whiz" stage in many midwestern states.

In fact, the underlying tone, rumored by more than one member to another, was that aquatic weed science has come into its own. A few members even speculated future meeting sites in Iowa, where Hy-

drilla was reportedly discovered this year.

Following a greeting by Steve Clark, mayor of Miami, President Robert J. Gates addressed the delegates. "Environmental improvement is, in effect, good housekeeping. It begins with the personal habits of individuals. . . . There are no bystanders. Everyone is directly involved, even when the subject is restricted to pesticides," he said. ". . .

We must not sweep any of our problems under the rug. On the other hand, we have the obligation to insist that regulation and control of pesticides be based on sound information and the benefit/risk equation soberly evaluated. . . .

"The greatest threat to all people, in my opinion, is the coalition of those who would sacrifice future economy in the name of ecology, and  
(Continued on page 36)

Grouped by a static display of airboats and assorted equipment used in aquatic weed control, members of the Hyacinth Control Society listen to Bob Blackburn (standing right) discuss application methods. This year the society toured the extensive facilities of the USDA Research Center at Fort Lauderdale.



## Cutrine-Diquat Combo Registered In Florida

Attention hydrilla in Florida. Look out!

The State Department of Agriculture of Florida has just registered Cutrine and Diquat as a tank-mix for the control of hydrilla and other submerged weeds.

According to Applied Biochemists, Inc., manufacturers of Cutrine, hydrilla has been choking Florida's lakes and canals for more than a decade. It is not readily controlled by previously registered products. The combination of Cutrine and Diquat have a somewhat synergistic effect to control this noxious weed.

Cutrine is Federally registered in all 50 states for algae control in potable water reservoirs, irrigation water, lakes and ponds. The Florida registration of the combination per-

mits use in the same areas as the Federal registration of Cutrine alone.

Research on the tank-mix combination was started three years ago. Robert D. Blackburn and his staff at the USDA Agricultural Research Service station in Ford Lauderdale experimented with a wide variety of chemicals and chemical combinations to provide the most effective, economical and safest means of control.

Field testing in 1971 indicated that the combination of Cutrine and Diquat was the most exceptional performer from the standpoint of effectiveness and economy.

Blackburn reported that the combination required less chemical to

achieve control than other products tested. He further observed that there were no fish kills and that weed desiccation was slow.

The Florida registration recommends four gallons of Cutrine and two gallons of Diquat be used per acre, mixed with enough water to allow even distribution of the herbicide in the area being treated.

Application is made by pumping through hoses as the hoses are dragged approximately one foot above the canal or lake bottom. Hoses should not be dragged on the bottom and should be no further than three feet apart.

Waiting periods recommended for the use of Diquat should be followed after application of the combination.





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## WEED CONTROL (from page 26)

shovel to do the job. But a single properly-timed spray will keep this ditch free of weeds and grass for many months, so the highway manpower and heavy machinery can be assigned to other road repair jobs.

Weed supervisor Ford coordinates the Pierce County weed and brush control program under County Engineer William Thornton, who in turn handles road maintenance under the county board of commissioners. The essential aim of the program is safe roads with minimum road maintenance costs. This can be a difficult task, since the county extends from Mt. Ranier to the Pacific Ocean and includes virtually every type of possible highway and weather condition.

Road maintenance costs have been climbing. Today roadside mowing, for example, involves \$20-\$25 per acre for labor; and equipment repairs can be costly, too. Usually they will average \$35 a day for every day equipment is operated. Roadside litter and unexpected, hidden obstacles often put mowers or tractors out of operation. These costs have made chemical weed and brush programs more attractive than ever. While only about one mile in seven in the County is now receiving chemical weed treatment with Kro-

var I, the savings achieved through the chemical program are significant, especially this past year when the County was hit with extra flood damage to its roads.

Priorities on county roads to receive chemical weed treatments are set by road supervisors, road foremen, and weed supervisor Ford. It is his responsibility to keep in touch with overall needs and to help train district crews, while looking for new developments that will help the County get better weed control without massive increases in budgets. Ford carries on the county program to control noxious weeds as well as the weed program related to road maintenance.

The Pierce County weed and brush program has come a long way in recent years. Weed supervisor Ford would be the first to say that it can make substantial gains in the future. New technology and new compounds, like Krovar I, have helped bring a new dimension to the weed program. What was learned last year about Krovar I, for example, persuaded Ford that this compound belonged in his program. What is being learned this year about Krovar performance on Pierce County roads will be built into plans for still better weed control in the years ahead.

Krovar I was applied to this roadside. Note that when a trained crew applies the spray, there is a wide margin of safety to the adjoining farm crop. Supervisor Ford helps train his applicators.

