

# NORTHWEST TURFGRASS TOPICS

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DECEMBER, 1967



## FROM THE PRESIDENT'S CORNER

By George Harrison

Our association was recognized as a representative of an important agricultural business when your president was asked to be present at the welcoming dinner for Dr. Terrell, the new president of Washington State University. Members from firms in all types of agriculture were there to acquaint the new head of the university with various aspects and problems of their businesses. It was interesting to note that many of their problems were ours, i.e. shortage of trained labor, wage rates increasing, increased capital equipment needed. It had a very familiar ring. Dr. Terrell made an interesting point that the university is not only interested in solving technical and research problems but, also, in solving human problems. (Remember the talk on urbanization and its problems at the conference?) We wish him well on his new challenge.

We are all acquainted with the fact that the costs of research and all technical progress are going up fast. To make the same effort this year that we have in past years is going to require more funds. These funds come from our memberships. Let's take the form

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## THE EFFECTS OF UREA ON SOIL pH AND CALCIUM LEVELS

By Roy L. Goss

Soils are complex chemical, physical, and biological systems. The continued use of fertilizers, especially in large quantities, may produce marked changes in these systems. It is obvious from the tabled data that rather large changes have occurred in calcium levels and pH values since research was started at the Western Washington Research and Extension Center. The table indicates what the soil pH and calcium levels were in 1959 and the existing levels in 1967. These putting green plots have received three levels of nitrogen (20, 12 and 6 pounds per 1000 square feet per season) two levels of phosphorus (0 and 4 pounds  $P_{205}$  per 1000 square feet per season), and three levels of potassium (0, 4 and 8 pounds  $K_{20}$  per 1000 square feet per season) in all possible combinations during this period of time. No calcium in the way of lime or other amendments has been applied to these plots.

When 20 pounds of nitrogen per 1000 square feet from urea was used, regardless of phosphorus and potassium levels, soils are ten times as acid as when 12 pounds of nitrogen from urea was used with the same phosphorus and potassium levels.

The pH change which occurs when urea and nitrogen is reduced from 12 pounds to 6 pounds per 1000 square feet per year is not significant, but the difference between the 6 and 20 pound rates is highly significant. This change has been in a gradual downward trend since fertilization was started and proves the necessity for maintaining accurate and current soil tests.

### The Effect of Fertilization on Soil Calcium Reserves

The table shows soil calcium levels after 8 years. It is interesting to note that treat-

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## OREGON COMPOST HEAP

By Byron Reed

We have just completed a most successful golf season here in Oregon. Oregon's weather was sunny and dry, some 100 days, I believe. It brought increased problems for the Golf Course Superintendents in turf management coupled with long hard hours of effort to keep the golf courses in playing condition. Compliments are surely in order for the Golf Course Superintendents in the state of Oregon.

For those readers who may wish to visit a meeting or two of the Oregon Turf Managers Association during 1968, I am listing our meeting schedule. We are anxious to have out-of-state visitors.

January 8, 1968. McNary Golf Club, Salem, Oregon, Mr. Charles Cross, Supt.

February 5, 1968. The annual Ornamental Short Course at Oregon State University, Corvallis, Oregon. The short course begins at 1:00 P.M. The morning session beginning at 10:30 A.M. will be hosted by Corvallis Country Club, Mr. Homer Gray, Supt. Dr. Roy Goss will be the guest speaker.

March 4, 1968. Emerald Valley Golf Club, Creswell, Oregon, Gene and Jim Russell, hosts. The Russell's are very proud of this new golf club having had a direct hand in building this new club. Our speaker will be Mr. Jim Carnes, W. R. Grace Company, and his subject is "The role of the seedman in turf today".

May 6, 1968. As in years past, our May meeting will be at Agate Beach Golf Club, hosted by Mr. & Mrs. Bill Martin, the owners of this fine golf club.

A crab feed the nite of May 5, 1968. Mr. Bill Bengeyfield, USGA, will be there to smile on us. Plan a family week end at one of Oregon's finest beach resorts.

Election of officers of the Oregon Turf Management Association was held in October. The total membership agreed to overwork Mr. Richard Malpass, Supt., Shadow Hills Estates Golf Club, Junction City, Oregon, and to re-elect Richard for another two-year term as our President. Richard has many accomplishments to look to his first two-year term as President. Financial assistance in grants to students interested in the turf management field, a never-ending effort to assist and visit those superintendents who called upon him for service, a keen effort to get a turf research program going here in Oregon and, of course, his loyalty to the office of President, Oregon Turf Management Association.

First Vice President is Mr. Frank Zook, Superintendent, Green Meadows Golf Club, Vancouver, Washington. This is Frank's



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second term in office having served as second vice president. Frank is an eager young man, also serving on the program committee. Second Vice President is Mr. Richard Schwau-bauer, Superintendent, Willamette Valley Golf Club, Canby, Oregon. Richard is a graduate of Oregon State University, married, and has two children. Richard recently moved from Bend, Oregon, where he served as the Superintendent of Bend Golf Club. We believe Richard to be great officer material which, of course, is so necessary to keep our Oregon Turf Management Association growing.

One could use such words as Alpha and Omega to cover our Mr. Ray Garner, Secretary and Treasurer. I just don't know how we could have survived without the services of Ray and his tireless effort in behalf of the Oregon Turf Management Association. It is hoped that Ray will gather some small pleasure of this mention.

Oregon will experience the largest golf club openings during 1968 in its history. I will cover this in the next column.

Editor's Note: The editor wishes to point out that Byron has manned one of the toughest positions in his organization in maintaining a good educational program for the members. Certainly, he is to be commended for this important job.

## FROM THE PRESIDENT'S CORNER

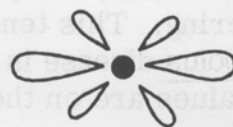
[Continued from Page 1]

enclosed in this issue of Turf Topics and present it to anyone you know who is a logical prospective member. You would be surprised how many people with a stake in the turf industry do not know that we exist. Show them your copy of Turf Topics and the Proceedings from the last conference so they know the help we are giving them.

Here in the Puget Sound Basin, October was as wet as the summer has been dry. Numerous incidents of disease were noted. Those on the regular preventive maintenance spray schedules seemed to be pretty much in control, but the man who skipped was distinctly penalized. We certainly hope that

Dr. Gould has returned from Europe with some new ideas that will help in this disease cure and prevention fight.

Some notes taken while traveling -- Jim Ticehurst of Cascade Golf had reservations at Harrison Hotel for the conference, but the night before he was to leave he wound up in the hospital with stomach problems. He is back on the job again and plans to make the next conference for sure. -- Cecil Thompson at Si View Golf Course had great success with bringing dired fairways back into play by applying one pound of nitrogen from ammonium nitrate to the grass in late August. The first moisture really turned them green gaining nearly two weeks over adjacent areas that had not been fertilized. -- The new Nile Temple Course is rapidly rounding into shape. They plan to open for play in April if all goes well. -- I understand that the Seattle Public Courses have ruled off carts for the duration of the winter. Seems like an excellent idea for some other courses that take such a beating from the compaction caused by those wheels. -- Many cemeteries are reporting great success in using Casoron in ornamental plantings for pre-emergent weed control, but there have been reports of damage to turf where applications drifted. These chemical tools are great but must be used correctly. -- The University of Washington Arboretum is offering pruning instruction in their Continuing Education Courses. Seems like an easy way to get instruction to your key men in this important winter job. -- How many of you are receiving the "Chewings" bulletin that Art Mehas in the King County Extension Office publishes? It keeps you up to date on the current horticultural problems and some of their suggested cures. -- Had a cemetery report that a smooth talking salesman offering weed killers at twice the local price came swinging through the territory. Gave real nice pen and pencil set premiums and other goodies. Catch the bargains by asking the analysis of the materials and compare with those available from your regular sales people.



# THE EFFECTS OF UREA ON SOIL pH AND CALCIUM LEVELS

[Continued from Page 1]

ments number 1 (20-0-0), 5 (20-0-4), and 6 (20-0-8) have highly depressed calcium levels for some reason. Furthermore, the two lowest calcium levels (in treatments 5 and 6) received no phosphorus; however, 1967 soil tests show both of these plots to be very high in phosphorus. The pH value of these two plots is very low (4.2 and 4.3, respectively) and may be low enough to render phosphorus unavailable or at least less available. It also appears that the lack of phosphorus application causes a greater uptake of calcium and a resultant lowering of pH. The same trend can be seen in treatments number 7 (12-0-0), 8 (12-0-4) and 9 (12-0-8). All treatments with low calcium levels also rate lower at the present time than those with higher calcium levels in color intensity.

The lower quality turf in low calcium plots may be associated with deficiencies or excesses of other nutrients that are affected by low calcium and pH. It is known that lime makes conditions favorable for nitrification and sulphofication, according to certain authorities. In our case, sulfur may be the limiting factor and, in fact, in other current trials we are finding that sulfur greatly improves the quality of turf in both color and vigor on these low calcium and low pH plots. This has previously been reported in articles relating to sulfur nutrition.

## Soil Reaction and Diseases

When plots were first established at the Research Center at Puyallup, the average pH, as noted in the table, was between 5.7 and 5.8. At this time a considerable amount of *Ophiobolus* patch disease was encountered. Within the next three years after the initial outbreak the amount of disease began decreasing and became specifically located in certain plots which was attributed to phosphorus and potassium levels. During this period of time when disease decreased, soil pH values likewise were lowering. This tends to indicate that less *Ophiobolus* disease is usually found when soil pH values are on the moderate to strong acid side.

It is believed by the writer that pH is not the most critical factor when considering both calcium levels and pH values. If the soil contains adequate calcium, slightly depressed pH values probably are not so important as when low pH values are encountered at the same time. Turfgrasses, particularly the bentgrasses, have the ability to do well under low pH conditions. Although low pH levels can render phosphorus less available, turfgrasses use only small amounts of phosphorus. In the case of bluegrasses, however, it is generally felt that higher pH values and higher levels of calcium are necessary for proper growth and longevity of this grass.

Table 1. Calcium levels and pH values after eight years of fertilization and clipping removal.

Treatment Number	Nutrients applied in lbs/1000 sq. ft./season			Calcium Levels		pH Levels	
	N	P	K	1959	1967	1959	1967
1	20	0	0	2966	475	5.8	4.3
2	20	4	0	2910	707	5.8	4.6
3	20	4	4	2798	1032	5.8	4.6
4	20	4	8	2659	662	5.7	4.4
5	20	0	4	2575	350	5.7	4.2
6	20	0	8	2687	462	5.7	4.3
7	12	0	0	2742	1692	5.8	5.5
8	12	0	4	2575	1297	5.7	5.3
9	12	0	8	2698	1592	5.8	5.3
10	12	4	0	2670	2245	5.8	5.7
11	12	4	4	2631	1965	5.7	5.6
12	12	4	8	2552	1902	5.8	5.5
13	6	0	0	2440	2070	5.8	5.9
14	6	0	4	2457	1756	5.7	5.9
15	6	0	8	2373	1795	5.7	5.7
16	6	4	0	2384	2210	5.7	6.0
17	6	4	4	2440	2175	5.8	5.9
18	6	4	8	2351	2070	5.7	5.7
19	0	0	0	2720	1930	5.8	6.0

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## Calendar of Events and Dates To Remember

- Feb. 5-6 Oregon Turf and Ornamental Short Course, OSU, Corvallis, Oregon
- Feb. 18-23 International Turfgrass Conference and Show, Hilton Hotel, San Francisco, California
- Mar. 12, 13, 14 Grounds Maintenance Workshops, Seattle and Olympia, Washington
- Apr. 22-23 National Recreation and Parks Association Conference, Spokane, Washington
- May 22 Public Turfgrass Field Day, Western Washington Research & Extension Center, Puyallup, Washington
- Sept. 25, 26, 27 Northwest Turfgrass Conference, Alderbrook Inn, Union, Washington

## A REVIEW OF THE 1967 TURFGRASS CONFERENCE

Those of you who were unable to attend the 1967 Northwest Turfgrass Conference at Harrison Hot Springs, British Columbia missed a very fine program. Harrison Hot Springs, British Columbia was a beautiful setting and location for the Conference and I am sure was enjoyed by all who attended. The weather even cooperated in staying very nice throughout the Conference and, in fact, most of the turfgrass managers in attendance would have welcomed some badly needed rain.

The conference was called to order and welcomed by Dick Malpass, 1966-67 President of the Association, who turned the meeting over to Dick Mitchell, the presiding afternoon chairman from Shaughnessy Golf & Country Club, Vancouver, British Columbia. The first afternoon speaker was Walter Boysen, President of the Golf Course Super-

intendents Association of America from Oakland, California. Walter gave a very inspiring talk on past, present, and future of the golf course superintendents. Mr. Boysen has been in this field many years and since he has been in contact with superintendents all over the nation is very qualified in his remarks. I am sure that everyone in attendance profited by his talk and private conferences.

Dr. J. B. LeBeau, Plant Pathologist from the Canada Department of Agriculture, Lethbridge, Alberta, presented some interesting data on the effect of snow mold and some other low temperature organisms in the prairie provinces of Canada. He reported on the success of the various fungicides, and a minor report on soil heating.

Bill Bengeyfield from the U. S. Golf Association, Green Section, Garden Grove, California, gave a thought-provoking discussion entitled "We are Going to be Challenged". Bill's talk included everything in this field from artificial turf on up through professionalism of the golf superintendent, and other turfgrass managers. The costs of managing turf were pointed out and that carefully planned budgets and operational procedures will be very important to the turf manager in the future.

## Parks are Becoming More Important

A panel discussion relating to the designing, building and maintaining of public parks was capably handled by Mr. Paul Beistel from Eugene, Oregon, and Mr. John Sandusky, Seattle Parks Department. Mr. Beistel showed some very beautiful slides on the development of parks in Lane County, Oregon,

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the amount of use these parks were getting, and some of the planning and thought that went into recreational areas for the public. Mr. Sandusky pointed out many of the engineering problems associated with soils, drainage, and subsequent maintenance of park areas. There are many hidden costs that many of us may not take into consideration that require some rather large budgets. Mr. Gerald Pelton of the National Parks and Recreation Association from Seattle, Washington, was asked to join this panel and presented some excellent information on the continuing need for more parks and more recreation areas and how the National Parks and Recreation Association fits into the total picture.

New concepts in turfgrass fertilizers was capably handled by Dr. Jim Beaton of the Consolidated Mining and Smelting Company of Trail, British Columbia. Jim gave a brief look at the future of some new fertilizers that will be coming into agricultural business in the next few years and pointed out that industry was making an effort to keep ahead of today's needs.

Toby Grether of the Cal-Turf Nurseries from Camarillo, California, gave a beautifully illustrated talk on the uses of stolons for turf. Mr. Grether described their operations and research program connected with stolons and sod and described some of the techniques of handling these materials.

Babe Brinkworth of the Toro Manufacturing Corporation gave an excellent illustrated slide talk on preventative maintenance of grass-cutting machinery. Babe pointed

out some of the age-old problems of neglect, as well as the good side of machinery maintenance, that would give it more or less life, depending upon its use.

Dick Turley from the Canada Department of Agriculture at Saanichton, British Columbia, presented an extremely useful talk on turfgrass irrigation. Contrary to much popular opinion Dick reported in his experiments that light, frequent irrigation maintained a higher level of soil moisture available for plant use than the infrequent heavy applications of water.

Dick Haskell, Director of Golf, City of Seattle, presented a great deal of information about public golf courses in a very short period of time. He pointed out many features such as the golf architect, selecting the site, and design of the public course for safety, playability, ease of maintenance, and many other essential features that go into making a good public golf course, even when total application was the same.

Among the other speakers were Alvin G. Law, Washington State University, Pullman, who talked on the advanced training for turfgrass managers. Dr. V. C. Brink, University of British Columbia, who talked on turfgrass texture, and Roy Goss who talked on developing specifications and plans for constructing turfgrass areas.

The Conference was terminated with a research report from the Western Washington Research and Extension Center, Puyallup, and research being conducted at the University of British Columbia.

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# HIGHLIGHTS OF THE AMERICAN SOCIETY OF AGROMONY MEETING FOR 1967

By Roy L. Goss

Division C-5, Turfgrass Management, has become a permanent part of the Annual Meetings of the American Society of Agronomy. In 1967 there were 25 papers presented in Division C-5 from research personnel from nearly every part of the United States. A number of interesting papers were presented on protecting cut and fill slopes for erosion control and establishment of turf and the various means of mulching and holding the soil in place.

Carbohydrate storage, soluble protein fractions, and the ability of the plant to withstand extremes of temperature, were discussed in several papers. The ability of the plant to withstand certain extremes is closely associated with some of these soluble fractions.

## Turfgrass Nutrition

Nutritional problems are always foremost in management. Two complete sessions were devoted to turfgrass nutrition. Session number 3 was general nutrition, and papers were presented by researchers from Iowa State University, Alabama, O. M. Scott and Sons Co., Hercules Powder Co., VPI, Michigan State University, and Texas A & M University. Although all these papers were well presented and had significant data, one of the most interesting was that presented by Dr. D. G. Sturkie from the Alabama Agricultural Experiment Station on the response of Zoysia and Bermuda to phosphorus and potassium. Although we are not interested in these grasses in the Pacific Northwest, the interesting thing was these grasses showed differential responses to varying levels of these two elements. Current research at the Western Washington Research and Extension Center indicates some similar relationships to those reported by Sturkie and these interrelationships are becoming even more clear-cut as the level of elements in the soil is lowered.

## Potassium Symposium

A special symposium on potassium nutri-

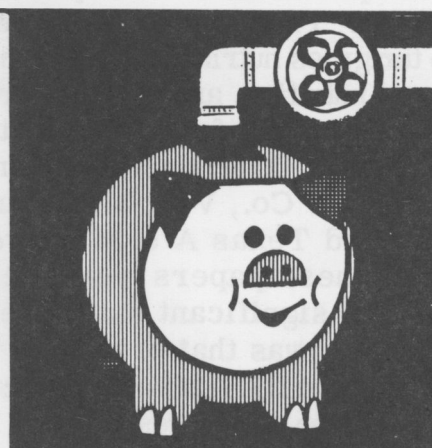
tion of turfgrasses was presented by R. E. Wagner of the American Potash Institute. W. B. Gilbert of North Carolina State University; Roy L. Goss, Washington State University; C. L. Foy of VPI; and Granville Horn, University of Florida. These five papers endeavored to present as much information as possible regarding the role of potassium in the metabolism of turfgrasses, some of the relationships of potassium nutrition and temperature stresses, the effect of potassium on turfgrass diseases, the influence of potassium on herbicides, and the response of turfgrasses to potassium source. Dr. R. E. Wagner pointed out that potassium is necessary for the function of more than 25 different enzymes and is very necessary in both carbohydrates and protein metabolism. Gilbert from North Carolina State pointed out there were some relationships between the level of potassium and the ability of grasses to withstand higher heat and cold stresses. Goss, from Washington State University, pointed out that he and C. J. Gould had found significant relationships between levels of potassium and other nutrients on the occurrence of Fusarium patch, Red thread, and Ophiobolus patch diseases.

C. L. Foy reported that there was little information available on the effect of potassium on herbicides, but did point out that proper nutritional balances were necessary for the best uptake and effect of applied herbicides. Granville Horn from the University of Florida, showed significant relationships between potassium sources and their effect upon turfgrasses. Potassium sulfate was one of the best sources for general turfgrass nutrition and this is possibly due to adequate levels of both potassium and sulfur. Since a great deal of work has not been conducted on sulfur nutrition, it is not known just what levels of sulfur are required. However, it appears that more work will be forthcoming in the near future.

Dr. Coleman Ward from Mississippi State University served as chairman of Division C-5 for 1967 and did an outstanding job of bringing together all speakers from over the nation and keeping the Conference running smoothly.

## 1967 CONFERENCE ATTENDANCE

1. Bud Ashworth, Liberty Lake, Washington
2. Dick Bailey, W. R. Grace Co., Halsey, Oregon
3. Harvey Banks, Kitsap G & CC, Bremerton, Washington
4. Tom Bartol, Rock Creek GC, Portland, Oregon
5. Clayton Bauman, Meridian Valley CC, Kent, Washington
6. Milt Bauman, Overlake G & CC, Medina, Washington
7. Bill Bengeyfield, USGA, Garden Grove, California
8. Jesse Bishop, McChord Field, Washington
9. Al Blair, Puget Sound Seed Company, Seattle, Washington
10. Robert G. Bowers, Wing Point GC, Bainbridge Island, Washington
11. Walter Boysen, Sequoyah CC, Oakland, California
12. Dr. V. C. Brink, University of British Columbia, Vancouver, B. C.
13. Babe Brinkworth, Toro Manufacturing Co., Minneapolis, Minnesota
14. Lloyd G. Brown, Belmor Park & GC, Federal Way, Washington
15. Auke (Sy) Byle, Edgar F. Kaiser Estate, Deer Harbor, Washington
16. Hal Chonle, Toro Supply, Yakima, Wash.
17. LeRoy Christian, Everett School District, Everett, Washington
18. Virgil Clark, Everett G & CC, Everett, Washington
19. Robert Cockburn, Early Bird Spray Service, Everett, Washington
20. Ben Colk, Richmond CC, Richmond, B. C.
21. Jack Dallyn, Canwest Seed, Vancouver, British Columbia
22. Robert Dauterman, Longview CC, Longview, Washington
23. W. E. Davis, Canadian Dept. of Agric., Research Station, Agassiz, B. C.
24. Wayne Dean, Yakima Metro. Park, Yakima, Washington
25. Norman DeChambeau, Holmes Harbor Investment Co., Langley, Wash.
26. Don Dodson, American Excelsior Corporation, Moxee City, Washington
27. Art Donaldson, Capilano GC, West Vancouver, B. C.
28. Peter Dotto, Marine Drive GC, Vancouver, B. C.
29. Don Doyon, Sham na Pum GC, Richland, Washington
30. Graham Drew, Department of Extension, Univ. of British Columbia, Vancouver.
31. Harold Drobott, Later Chemicals Ltd., Richmond, B. C.
32. Cliff Everhart, Manito G & CC, Spokane, Washington
33. Fred Ewing, Carnation GC, Fall City, Washington
34. Newton Fallis, Columbia Equipment, Vancouver, B. C.
35. Dick Fluter, Oswego Lake CC, Lake Oswego, Oregon
36. Ed Fluter, Glendoveer GC, Portland, Oregon
37. Russ Fouts, Spring Hill CC, Albany, Oregon
38. Frank Gavan, Cedar Hill GC, Victoria, British Columbia
39. Dick Gettle, Fircrest GC, Tacoma, Washington
40. Al Gleeson, Golfland Driving Range, Richmond, B. C.
41. Murl Goddard, Elks GC, Selah, Washington.
42. Roy L. Goss, Washington State Univ., Puyallup, Washington



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43. Tobias Grether, Cal-Turf, Camarillo, California
44. William Griffing, Nile CC, Edmonds, Washington
45. Manny Gueho, Vancouver GC, New Westminster, B. C.
46. John Haberlin, Haberlin Nurseries Ltd. Vancouver, B. C.
47. George Harrison, NuLife Fertilizers, Tacoma, Washington
48. John Harrison, Hayden Lake CC, Hayden Lake, Idaho
49. Dick Haskell, Seattle Park Department, Seattle, Washington
50. Leonard Hays, Salishan GC, Gleneden Beach, Oregon
51. Omer Henderson, Edmonds School District #15, Lynnwood, Washington
52. Des Hofler, Northern Industries Ltd., Richmond, B. C.
53. Don Hogan, Associate Engineer, Seattle, Washington
54. Harold Huffman, Green Valley Fertilizer, No. Surrey, B. C.
55. John Jaslowski, Broadmoor GC, Seattle, Washington
56. Walt Jefferson, Wenatchee Golf Course, Wenatchee, Washington
57. Ed Jennings, Snohomish Golf Course, Snohomish, Washington
58. Bud Johnson, Alderbrook G & CC, Union, Washington
59. Wes Johnson, Alderbrook G & CC, Union, Washington
60. Ron Johnstone, Taylor, Pearson & Carson, Ltd., Vancouver, B. C.
61. Glenn Jorday, Ferndale, Washington
62. Jack Jung, Velsicol Chemical Corporation, San Jose, California
63. Harvey Junor, Portland Golf Club, Portland, Oregon
64. Art Kain, Wayne GC, Bothell, Washington
65. Tom Keel, Douglas County Parks, Roseburg, Oregon
66. Emil Kissel, Metro. Park District, Yakima, Washington
67. Heinz Knoedler, Northern Industries, Ltd., Richmond, B. C.
68. Ben Korsten, Emerald Turfgrass Farm, Seattle, Washington
69. Bob Krueger, Turf & Toro Supply, Seattle, Washington
70. Jack W. Laird, School District, Kamloops, British Columbia
71. Bob Larson, Bellingham G & CC, Bellingham, Washington
72. Howard R. Larson, Scott Lake GC, Olympia, Washington
73. Dean Latimer, Fort Lewis GC, Tacoma, Washington
74. Alvin G. Law, Washington State University, Pullman, Washington
75. George Lawton, Tacoma Country Club, Washington
76. Jack Lebeau, Lethbridge, Alberta, Canada.
77. Sam Mackness, Royal Colwood G & CC, Victoria, B. C.
78. Roy Maling, Buckerfields, Ltd., New Westminster, B. C.
79. Richard Malpass, Shadow Hills Estates, Eugene, Oregon
80. Jack Martin, Oliver Cherry Grove CC, Oliver, B. C.
81. Reg. S. Martin, Taylor, Pearson & Carson, Ltd., Vancouver, B. C.
82. Ken McKenzie, Pacific Agro, Seattle, Washington
83. Don McLeod, Penticton GC, Penticton, British Columbia
84. Jim McLeod, Richmond CC, Vancouver, B. C.
85. Arthur A. Mehas, Cooperative Extension Service, Seattle, Washington
86. Don Miller, A-1 Spray Service, Tacoma, Washington
87. Nick Metal, Globe Fertilizer, Ltd., Vancouver, B. C.
88. Richard Mitchell, Shaughnessy G & CC,

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89. John Monson, Useless Bay CC, Langley, Washington
  90. Earl P. Morgan, Similk Beach GC, Anacortes, Washington
  91. Ken Morrison, Washington State University, Pullman, Washington
  92. Robert Montgomery, Coos Bay Country Club, Oregon
  93. Bob Murphy, Chilliwack CC, British Columbia
  94. Tom Neidlinger, Diamond Alkali Co., Cleveland, Ohio
  95. R. A. Nicholson, Surrey Parks Department, Cloverdale, B. C.
  96. E. Nielson, Lane County Parks Department, Eugene, Oregon
  97. Arlo Ottmar, Ritzville Municipal GC, Washington
  98. Gerald W. Pelton, National Recreation & Park Association, Seattle, Washington.
  99. Bill Pierson, Diamond Alkali Co., Lake Oswego, Oregon
  100. Joe Pottenger, Suntides GC, Yakima, Washington
  101. Glen Proctor, Rainier G & CC, Seattle, Washington
  102. Larry Proctor, Oakbrook Golf & Country Club, Tacoma, Washington
  103. Ron Proctor, Rainier G & CC, Seattle, Washington
  104. Ken Putnam, Seattle GC, Seattle, Wash.
  105. Raplee, Washington Tree Service, Seattle, Washington
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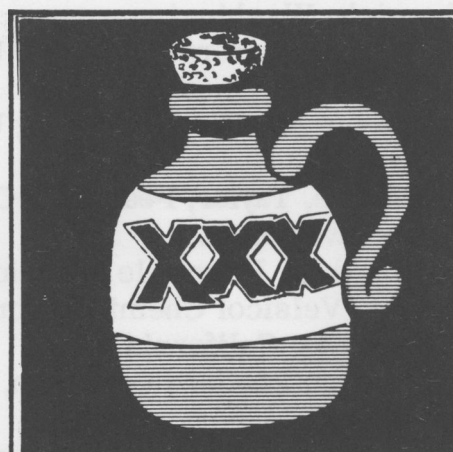
110. Ed Rogers, Northwest Mower & Marine, Seattle, Washington
111. John Sandusky, Seattle Park Department, Seattle, Washington
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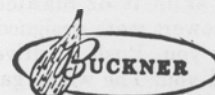
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