

Mineral Content in Fertilizers Underscored at Oklahoma's Annual Turf Grass Assn. Conference Nov. 4-6 in Stillwater

By LEE STEVENS, Associate Editor, Oklahoma State University, Stillwater

A hypothesis formulated in the middle of the 18th century by Justis Von Liebig, a German scientist known as the father of agricultural chemistry, is still a guide for a successful turfgrass program.

Dr. Wayne W. Huffine, an Oklahoma State University turfgrass researcher, talking at the 19th annual meeting of the Oklahoma Turf Grass Association held on the campus of OSU, November 4-6, told the group that Von Liebig's hypothesis that "the crops on a field diminish or increase in exact proportion to the diminution or increase of the mineral substances conveyed to it in manures" still holds true. Theme of the conference was "Fertilization of Turfgrass".

In putting Von Liebig's hypothesis in more direct terms, Huffine explained that nitrogen alone is not enough for optimum plant growth. "Even though nitrogen is the key element in turf production, all of the essential elements must be present in sufficient amounts to meet the needs of the grass to grow good turf," he said.

Elements for Plant Growth

The turfgrass researcher reported that 15 elements are known to be essential for plant growth—carbon, hydrogen, oxygen, phosphorus, potassium, magnesium, nitrogen, sulphur, iron, calcium, molybdenum, manganese, boron, copper, and zinc.

Nitrogen is responsible for color and vegetative growth and constant liberal supplies are essential for good leaf and satisfactory root development. Phosphorus is a necessary part of all living tissue and is particularly important in stimulating quick development of a good root system in a newly seeded grass. Potassium is needed to help produce energy and plant structural



Inspection of experimental turf plots is standard procedure at most of the turf conferences now offered throughout the country. During the Oklahoma Turf Grass Association meeting, Dr. Wayne W. Huffine (left) explained the Oklahoma plots to (left to right) Dr. G. C. Horn, University of Florida, Gainesville; Dr. Coleman Ward, Mississippi State University, State College, Miss.; and Dr. N. D. Morgan, American Potash Institute, Shreveport, La. All those pictured were on the program.

materials by aiding in production and movement of starches and cellulose.

In a report of progress in turf management research a number of studies were discussed by Dr. Huffine. Of timely interest was the report that the herbicides dicamba and silvex were found to be equally effective in the complete control of henbit and chickweed at rates as low as $\frac{1}{2}$ pound of active ingredient per acre when applied in early January; however, they were only 30 to 90 percent as effective when applied in early March. Crabgrass was completely controlled with the preemergence herbicides Bandane, Betasan, Dacthal, Pre-San, TOK-2, and Zytron.

The optimum height to mow several turfgrasses as determined by the largest quantity of chlorophyll in the grass per unit area was found to be $\frac{1}{2}$ inch for Sunturf, Tifgreen, Tifway and African bermudagrasses, and 1 inch for Meyer zoysiagrass. In a study of the salt tolerance of sev-

eral turf-type bermudagrasses, Sunturf was found to be slightly more tolerant to high levels of sodium chloride than Tifgreen; however, both varieties were found to make satisfactory growth on soils of rather high salt content.

Dithane M-45 for Algae

Eradication of algae was obtained with Dithane M-45 at six ounces per 1,000 square feet on newly planted turf plots being established at OSU, consisting of Tifgreen (Tifton 328) bermudagrass, and Seaside Creeping bentgrass.

Dithane M-45 was applied on greens where algae had developed at the Hillcrest Country Club, Bartlesville, and the Quail Creek Country Club, Oklahoma City. Good control was obtained in both cases.

Leland Tripp, Extension agronomist of OSU recommends fertilizer applications on turfgrass be made on the basis of a soil test. "This gives the plant

the nutrients that it needs at a minimum cost," he said.

Another tool that can be used in turfgrass maintenance and discussed at the meeting is tissue testing. This test discussed by Dr. N. D. Morgan of the American Potash Institute provides an analysis of tissue content of the plant and is easily done with a kit provided for this purpose.

The tissue test supplements the soil test which gives the nutrient level of the soil while the tissue test shows the plant nutrients being supplied to the plant.

"By use of both of these tools a very close approximation of the plant needs can be determined," said Tripp.

Also appearing on the three-day program were Dr. G. C. Horn of Florida State University, Dr. Vic Sheldon of John Deere Chemical Company, Charles Wilson of Milorganite, and Dr. J. Q. Lynd, Dr. Lester Reed, Dr. Harry Young and Dr. R. V. Sturgeon, all of OSU.

Herbicide Sales Above '63

Sales of herbicides and other plant growth regulators are placed at about 23% of the total potential market, an increase of some 4% from 1963. This figure is indicated in a news release from the National Agricultural Chemical Association, Washington, D. C.

Extreme wet weather in a number of major crop areas of the Middle and Far West was a large factor in creating the increase. Sales of fungicides also show a slight gain of 1% over 1963, to some 15% of the market.

As in previous years, the use of herbicides, including desiccants, defoliant and other plant growth regulators, continues to show a steady increase.

Kans. Treemen Meet Jan. 21-22

A full program presenting the newest information pertaining to tree care and maintenance has been readied for delegates to the Kansas State Shade Tree Conference set for Jan. 21-22 at Manhattan, Kansas.

The conference will meet at Umberger Hall, Kansas State University.

Southern Weed Conference Meets in Dallas, Jan. 19-21

Teaching, research, extension, and industry authorities plan to participate in the Southern Weed Conference program at the Hotel Adolphus in Dallas, Texas, Jan. 19-21. Officials expect almost 900 persons to attend the conference this year.

Taking part in the general session on "Weed Control in the Changing South," will be: Dr. R. E. Patterson, dean and director of the College of Agriculture at Texas A & M University, and Dr. Selz C. Mayo, head of the Departments of Rural Sociology, Sociology and Anthropology at North Carolina State, University of North Carolina, Raleigh.

Other speakers will include: Dr. G. M. Shear, Dept. of Plant Pathology and Physiology at Virginia Polytechnic Institute; Tom E. Corley, Dept. of Agricultural Engineering at Auburn University; Turney J. Hernandez, E. I. du Pont de Nemours & Co.; and Southern Weed Conference President R. E. Frans, Dept. of Agronomy, University of Arkansas.

More than 150 papers are scheduled for presentation, covering eight aspects of weed control. Chairmen and major program subjects are:

Weed Control in Agronomic Crops Including Turf and Pastures. Chairman: Paul W. Santelmann, Dept. of Agronomy, Oklahoma State University, Stillwater.

Weed Control in Horticultural Crops. Chairman: Raymond B. Taylorson, Crops Research Division, USDA, Tifton, Ga.

The Control of Weeds and Woody Plants in Forests and Rangelands. Chairman: Orel G. Otwell, Chipman Chemical Co., Pasadena, Texas.

The Control of Weeds and Woody Plants on Utility, Railroad, and Highway Rights-of-Way and in Industrial Sites. Chairman: F. E. Gonzales, E. I. du Pont de Nemours & Co., Atlanta, Ga.

Aquatic Weeds and Special Weed Problems. Chairman: Lyle W. Weldon, Crops Research Di-

vision, USDA, Fort Lauderdale, Fla.

Ecological, Physiological, and Edaphic Aspects of Weed Control. Chairman: Howard L. Morton, Crops Research Division, USDA and Texas A & M University, College Station, Texas.

Extension, Teaching, Regulatory and Public Health Aspects of Weed Control. Chairman: Jon W. Hooks, Elanco Products Co., Columbia, S. C.

Developments from Industry. Chairman: Hoyt A. Nation, The Dow Chemical Co., Wayside, Miss.

New York Arborists Meet In Ithaca, Jan. 17-19

A trade show which will include demonstration of equipment is a feature of the New York Arborists Association winter meeting, scheduled for Jan. 17-19, at the Statler Hotel in Ithaca, N. Y.

A meeting of directors is set for Sunday afternoon, Jan. 17. A general meeting for the membership will follow later in the evening. The association's annual banquet will conclude Monday's program which will begin with the annual business meeting. The banquet is slated for late afternoon.

Three workshops, each undertaking a specific phase of the arborist industry, will be held during the final day of the meeting. Panel discussions on general topics are also on the program.

Arborists Meet in Florida

Important discussions bearing on business, new techniques in the tree service industry, and many other topics of interest will be brought into focus when delegates to the National Arborist Association Winter Meeting assemble Feb. 14-16 in Florida.

Site for the annual event is Guy Lombardo's Port-O-Call Inn, on Tiera Verde Island, near Clearwater, Fla.

Information may be obtained from Dr. Paul E. Tilford, Executive Secretary, National Arborist Assn., Box 426, Wooster, Ohio.