

a strong recommendation for a concentrated product. It is estimated that the total saving in freight costs for 1928 amounts to \$9,900,000 over freight costs for 1914 on a basis of like consumption for the two years. In 1929 there were 832 fertilizer plants in the United States, mostly in the East and South.

The United States is well supplied with raw materials required in the production of phosphate fertilizer, but is largely dependent on imports for potash. At the present rate of use it is estimated that the total reserve of phosphate rock known to exist in the United States will last some 2,000 years.

It is hopeless to expect to obtain a cheap fertilizer containing any considerable quantity of organic nitrogen. A great saving might possibly be expected in filling nitrogen requirements by such a radical change in practice as the direct application to the soil of aqua ammonia (ammonia in water solution).

Questions and Answers

Preventing injury to bent greens from brown-patch.—In September of last year we planted four of our greens with bent stolons and the remaining five with bent seed. Neither the stolons nor the seed have shown proper development, and it has occurred to us that possibly we are too far south for the proper growing of bent grass. Our soil is a sandy loam and as a rule we have early springs and mild autumns. Do you think we would get better results with Bermuda grass? (West Virginia)

ANSWER.—We do not think you are too far south for success with bent greens, as these are proving satisfactory as far south as points in North Carolina. It would, of course, be possible for you to have fine Bermuda greens during summer, but this grass can not be compared with bent grass for putting purpose, and has the disadvantage of becoming dormant after the first frost in the fall. Located where you are, there is no reason why you can not have success with bent grass. Your trouble is probably due to the brown-patch disease, which is particularly damaging to turf from June to late September. During these months it is necessary to apply fungicides to bent grass to save it from injury. The fungicide with which we get most success is a mixture of 1 part of corrosive sublimate to 2 parts of calomel, applied to putting greens at the rate of 3 ounces to 1,000 square feet, for the first application. The application should be repeated as soon as a fresh attack of brown-patch is noticed, at which time the rate may be reduced to 2 ounces to 1,000 square feet. If the applications have to be made within a week of each other, 1 ounce to 1,000 square feet is sufficient. It must be remembered that the application of a fungicide simply kills the fungus causing the disease and hence merely temporarily checks the disease. Therefore areas that have been allowed to become injured do not become green again until the injured grass has recovered new growth. In hot, muggy weather, when the conditions are particularly favorable for the growth of fungus, applications of fungicides may have to be made every week or so. Further information on brown-patch and its control is contained in the Bulletin for December, 1927.



Seventh hole (225 yards), Women's National Golf and Tennis Club, Glen Head, L. I.



Modern civilization rests upon physical science, for it is physical science that makes intelligence and moral energy stronger than brute force. The whole of modern thought is steeped in science. It has made its way into the works of our best poets, and even the mere man of letters, who affects to ignore and despise science, is unconsciously impregnated with her spirit and indebted for his best products to her methods. She is teaching the world that the ultimate court of appeal is observation and experience, not authority. She is creating a firm and living faith in the existence of immutable moral and physical laws, perfect obedience to which is the highest possible aim of an intelligent being.

Thomas Huxley

