Kentucky bluegrass occurs naturally over most of North America. Under field conditions in Minnesota, soil temperatures as low as −4° F. for considerable periods have been reported at a depth of 2 inches under the sod. While no actual counts have been made under such conditions observations in the spring have not indicated any difference in the density of moderately fertilized turf due to cold. It would seem, therefore, that the work here reported does not justify a fear that harm will result from low temperatures when turf is moderately fertilized in fall.

WILL WAR AFFECT OUR FERTILIZER SUPPLIES?

Our supply of fertilizers was seriously reduced when the World War cut off some of our importations in 1914. Therefore the question naturally arises, "What effect may the present European war have on fertilizer prices in this country?" According to an editorial in the Fertilizer Review there is apparently no danger of a shortage, nor is there a likelihood of any extreme price increase, as America is in a much better position with reference to fertilizer materials than it was in 1914. The editorial states:

"Then we were almost entirely dependent on Germany for potash and on Chile for nitrates. Then the production of war munitions interfered with the manufacture of superphosphate because sulphuric acid was necessary in large quantities for the manufacture of explosives. Supplies of all three major plant foods—nitrogen, phosphoric acid, and potash—were seriously affected then by war needs or conditions.

"Today we find our own country producing in peace time nearly two-thirds of our potash consumption, with ability, if emergency conditions make it necessary, to produce from our California and New Mexico sources all the potash we need. In addition, France, Spain, Palestine, and Russia are all producing potash, a part of which will no doubt find its way here.

"Chile is no longer the only source of nitrates for plant food and powder. Synthetic processes for the fixation of nitrogen from the air, developed during and after the World War, include the domestic manufacture of nitrate of soda and nitrate of ammonia for agriculture, and nitric acid and its derivatives for explosives. Nitric acid is produced without the use of either nitrate of soda or sulphuric acid so that these materials are released for fertilizer use. Sizeable stocks of nitrate of soda

from Chile are already in store and importation continues.

"Sulphuric acid will continue available for superphosphate production and will not be requisitioned for nitric acid manufacture as was the case in the World War. Our phosphate rock reserves are enormous and our production capacity far exceeds any possible domestic demand. In addition our exports of phosphate rock to Germany, our largest foreign customer for this material, have been interrupted by the British blockade.

"Production of ammonia solutions, now equal to the peace-time demand, can be easily and quickly increased to meet an increased war-time demand. Larger quantities of by-product sulphate of ammonia will undoubtedly be available as steel production forces the coking of more coal for blast furnace coke.

"Organic sources of nitrogen, such as vegetable meals and tankages, largely by-products of other industries, will be available in larger quantities as their respective industries increase operations. At present, for tenable reasons, organic materials are the only ones that have risen greatly in price.

"We have a surplus of cotton for bag manufacture and we have available paper bags if the importation of jute for burlap bags should be interrupted, or prices be unduly raised.

"In short, we seem to have on hand or in sight all the materials and supplies necessary for a normal fertilizer season next spring. If production costs increase because of general economic conditions, because of transportation costs, or because of general wage increases, then naturally the cost of fertilizer production will also increase."

As a result of these facts the conclusion is drawn that, "There seems to be no need, either on the part of the manufacturer or the consumer, to lay in extraordinary or unseasonable supplies of fertilizers or fertilizer materials for fear of shortage or unwarranted price increases."

BALANCE SHEET FOR PLANT NUTRIENTS

An interesting balance sheet regarding the annual losses from and additions to the soils of the United States of six of the plant food elements was published by the late Jacob G. Lipman in a New Jersey Agricultural Experiment Station Bulletin. Data were taken from 14,500 analyses of topsoils from all parts of the United States, from census figures of 1930, and from reports of the United States Department of Agriculture, the Geological