

leguminous and tap rooted plants should be used as plant food gatherers ; third, that animals should be kept often as much for the value of the manure they produce as for the profit realized from them by their other products ; fourth, that the least possible amount of straw and vine and limb be grown consistent with economy and the health of the plant ; and fifth, after having practiced all the economy possible in conserving the fertility of the land, and after having used most intelligently all the fertility that can be secured from the soil, the plant and the animal, if there is still a lack in order to secure the highest quality of product and the greatest net income, then, commercial fertilizers of a high grade purchased from reliable firms should be applied with a liberal hand. And if it is found at any time that commercial fertilizers give better net results than farm manures, then there should be no hesitancy in changing from one to the other. I believe that farm manures which have lain in the open yard or have been heated and which have to be drawn long distances, are far more expensive than are high grade fertilizers. We have seen that well preserved manure is worth on an average scarcely more than three dollars per ton, and our experiments prove that such manure exposed in piles from April to October often loses one-half of its value, therefore I am led to believe that many tons of manure which are transported from the city contain less than a dollar's worth of soluble plant food. This manure may act beneficially as a mulch, but so far as the plant food it contains is concerned, it is too often an expensive way of preserving the fertility of the land.

THE TEXICOLOGY OF THE COPPER COMPOUNDS WHEN APPLIED AS FUNGICIDES.

By PROF. D. G. FAIRCHILD, *Assistant Pathologist of the United States
Department of Agriculture.*

In using Bordeaux mixture, the speaker said, the horticulturist should begin the treatment early in the season, later using an ammoniacal solution to assist the rain in washing away the former solution. There was danger, the speaker continued, in the absence of the use of the Bordeaux mixture. The mixture may be used too frequently, so that rains cannot wash off the fungicide, or it may be used too late in the season so that before it is washed off the harvest