

DANGER OF COPPER.



PROF. GERALD MCCARTHY, of the North Carolina Experiment Station, writes as follows to one of that State's papers: In the warfare against the rapidly increasing number of disease-producing parasites, the fungicide most commonly employed in this country is the Bordeaux mixture, which, as commonly made, contains six pounds of copper sulphate to each 22 gallons. To spray one acre of grape vines once, takes about sixteen gallons of this mixture and usually six treatments are required for each season. This gives a total of about 400 gallons per acre, containing about 108 pounds of copper sulphate. All of this copper eventually finds its way into the soil. Copper salts are a deadly poison to all absorptive plants. Is there not danger that the accumulation of this substance in the soil of our gardens and orchards, if persisted in for a series of years, may eventually affect the fertility of the soil? There is very great danger. And let it be understood that when once the soil is sterilized by this poison, not all the guano on the coast of Peru can ever restore it to its former state, or make it fit to bear one blade of grass.

The possible danger of such poisons has already occasioned considerable alarm in Europe. It came up for discussion at the last meeting of the German Association of Naturalists. It was shown that copper sulphate in the soil soon becomes copper oxide, which is practically insoluble and remains in the upper stratum of the soil. The sulphuric acid in the copper sulphate combines with the potash and lime in the soil and with them forms more or less soluble compounds which are washed into the drains, or so far below the reach of most plants as to be practically lost. Its deleterious action is therefore two-fold: it destroys the young roots of plants and causes the useful potash and lime in the soil to leach away. When lime is added to the copper before it is sprayed, the baneful effect of the latter upon the potash and lime in the soil is largely prevented, but its evil effect upon the growing plant-roots still remains. The horticulturist must therefore bear in mind that the fungicides he uses are by no means friends to be depended on without limit. They are necessary evils, to be used with caution and the greatest economy. By hygienic precautions the amount of copper salts used can be greatly decreased.

GRAPE JUICE.—Use thoroughly ripe and fresh Concord or Isabella grapes. Allow one quart of water to three quarts of grapes freed from the stems. Let it come slowly to a boil, and when the whole mass is boiling hot, strain the juice through a cheese cloth, then return the liquor to the fire and as soon as at a boiling point again bottle and seal tightly. The less the fruit is cooked, the brighter will be the color and the better the natural flavor of the grape will be retained. It must be at the boiling point when sealed. A little sugar may be used if preferred. Keep in a cool place.