

MANURES FOR THE ORCHARD AND GARDEN.

(Extract of Paper read before the Western New York Horticultural Society by Joseph Harris.

MANURE is a by-product. Its price is determined, not by the cost of production, but by competition among consumers. If stable manure were sold in Rochester for 10 cents a load, there would be just as much produced as if it sold for \$2.00 a load.

This view of the subject seems to be overlooked. If gardeners, nursery-men and fruit growers would study the subject of the oft ridiculed "special fertilizers" I am confident they would soon be able to use them with great profit, and not be obliged to bid against each other for the by-product of the city stables.

As fruit producers we should study to grow those crops that people are willing to pay a good price for. And if we grow crops in which the carbo-hydrates, instead of being worth \$30 per ton, are worth \$100, or \$200 or \$300 or \$500 or \$1000 per ton, we should see to it that the plants have all the food, and especially all the nitrogen, that they want to produce a maximum growth. It will not pay, perhaps, to use nitrogen to grow carbo-hydrates in hay, corn, oats and wheat, but it will pay largely to use them to grow carbo-hydrates in apples, pears, peaches, strawberries and other fruits. But it should be understood that when we use manure for fruit trees we should see that the fruit trees get it. If we grow wheat, oats, potatoes, beets, strawberries and seeds among our peach, pear, and apple trees, we should have to furnish an excessive supply of nitrates before the fruit trees would get much of it. The greater portion would be absorbed by the annual crops and weeds, and it may well happen that a moderate dressing of manure would, by increasing the growth of the weeds, actually lessen the crop of fruit, for the reason that the greater the growth of the weeds the more water they evaporate and the

drier would be the soil where the roots of fruit trees are searching for food and water.

As vegetables and fruits are improved, they require richer land, just as improved herds of animals require richer food. I do not call grass and hay rich foods; neither are phosphoric acid, potash, soda, lime, magnesia and other ash constituents rich food for plants. They are absolutely indispensable, but in addition to these we must have a liberal supply of nitrogen. It is nitrogen that makes rich land. Of the three most costly ingredients of plant food, nitrogen, phosphoric acid, and potash, nitrogen is the only one that can be evaporated or washed out of the soil, and it is only in the form of *nitrates* that nitrogen can be washed out of the soil. And there seems good reason to believe that it is only in the form of nitrates that nitrogen is taken up by ordinary plants.

One thing is certain, our orchards need more nitrates, or, as we used to say, more available nitrogen. If we can get nitrogen, it is a comparatively cheap and easy matter to get phosphoric acid, potash, etc. The cheapest source of nitrogen is the organic matter in the soil, and this is derived from a previous vegetable growth, possibly some of it thousands of years ago and some of it only last year. The more recent the growth the more readily it is changed into nitrates. It is only within the last dozen years that we know how the nitrogen of organic matter was converted into nitrates and thus rendered available food for plants. The change is effected by a minute plant, or what would popularly be called a fungus. The essential conditions for its growth are air, a moderate temperature, moisture and lime, potash or soda.

Stagnant water, by excluding air,