demonstrated to him that shallow tillage, by affording a mulch of fine soil upon the surface and breaking up the capillarity in the soil, conserves that moisture so essential to plant growth during our hot dry months of June and July and sometimes a part of August. Besides this, it has been shown that the mechanical effect of loosening up the soil and making it pervious to the action of the air, is most helpful in -endering available those elements of fertility which would otherwise lie a long time locked up in the ground, but now we are learning that it has also a positive effect upon the temperature of the soil. Seeley (Mo. Weather Rev., 1901) shows from actual tests that newly cultivated soil is 6 degrees warmer at the surface; 5 degrees lower three inches below the surface; and about the same twelve inches below-conditions most favorable for plant growth. The warnier surface soil hastens the process of growth in the plant, and it is a protection against frost. The soil just below the surface being cooler, retards capillarity and thereby retains the soil moisture, while the temperature about the roots is about the same or a trifle higher than the same in uncultivated soil.

LIME FOR SOILS.

A METHOD of determining accurately the quantity of lime to apply to soils to neutralize the acidity has been described by Dr. Hopkins at a recent meeting of official chemists at Washington, D. C. That lime is useful in agriculture has long been recognized in practice, but just in what quantities to apply it, and to what soils, has been a problem. The old warning is expressed in the couplet:

> The use of lime without manure, Will surely make the farmer poor

has deterred many from using it at all. In many cases it would no doubt give splendid results, especially in cold acid soils. Now, if we can definitely determine the acidity of a soil and the proper amount of lime to apply to correct this condition, we have before us an advance step in soil fertility. Wiley, in an address on the subject, concluded as follows: "Agricultural chemistry, passing from having determined what the soil is and ..hat plants are and how fertilizers can be made and applied, is now advancing to a still higher plane of investigation, to determine how the soil shall be made maximum in production and how the conditions of growth shall secure the maximum of desired qualities."

NITRATE OF SODA FOR TOMATOES.

7 OORHEES (New Jersey Expt. Sta.) has found by experiment that the application of 200 lbs. per acre of nitrate of soda to tomatoes in two equal applications during the growing season increased the yield by 3,220 lbs. per acre, and when the same quantity per acre was applied in three equal distributions, the yield was increased This is a sufficient evidence in 5,880 lbs. favor of the judicious use of this fertilizer. It must always be borne in mind that its effect is to increase of the vigor of the plant growth, and in some cases this would mean a proportionate decrease of fruitfulness. For example, Voorhees reports having tried a larger quantity with distinct loss in quality of vield. In one case he used 300 lbs. per acre, applied as above, and the yield was decreased by 475 lbs. over that treated with 200 lbs. of nitrate of soda, because of larger vine growth and later maturity of fruit.

THE KLEFFER SELF-STERILE.

POWELL (Del. Exp. Sta.) reports blossoms of the Kieffer practically selfsterile, and that LeConte is a good pollenizer for it. However, we do not need to worry about a crop failure of this pear, for his records of 1901 show that if two blossoms out of one hundred set fruit the resulting crop will be a heavy one.