

rapidity. The destructive effects of this fungus are usually observed on the tubers late in the fall; but it is present in the plant much earlier in the season and may be recognized by the blotched, black, or brown-spotted dead appearance of the stems and leaves. Numerous small white spots may be observed upon closer inspection, and when highly magnified these are found to be miniature forests of slender stems growing out of the tops of the potato. The seeds of this fungus, called spores, are developed in millions, and are small enough to rest easily on the point of a pin, and light enough to be blown readily from field to field. The mature fungus develops in the tops and tubers of the potato, and consists of very numerous, colourless, irregular, branching, tube-like threads. These threads grow through the tissues of the potato, feeding upon its juices and rendering it a prey to low forms of life, which induce putrefactive decomposition. The summer spores are the product of this mature fungus, and while the former live only a short time, the latter is perennial and hardy and the least portion of it is capable of reproducing a new plant. These two important facts are regarded by Prof. Spalding as being well ascertained:

"(1) The fungus spreads from one plant to another during the growing season by summer spores, rain-washed or wind-blown;" and

"(2) It depends primarily for its spread the following season upon its perennial mycelium (the tube-like threads) always to be found in the diseased tubers and tops."

Experiments have shown that with only moderate watering the summer spores will penetrate the ground to the depth of several inches, their jelly-like contents pushing out a long, slender tube capable of growing down into any part of the potato plant to begin a new cycle of growth; hence it is assumed that hilling up will afford no protection. Nor is it known that any treatment can be applied to the growing plants—such as Paris Green to the Colorado bug—that will have any effect on the parasite without also destroying the potato plant as well. The preventive measures recommended are the following:

1. The parasite may often live over winter in the tops of decaying tubers left in the fields after harvest. Prudence would therefore dictate the complete removal and destruction of such refuse. It should be buried or burned. It should not be used for compost.

2. Store the harvested crop in dry cellars, and sort over several times at short intervals, carefully removing from the bins every tuber which shows the least sign of decay. Remove also to a separate pile those tubers which have been lying in contact with the diseased ones. The sorting will be facilitated and the decay hindered by storing the tubers in casks, barrels, or small boxes. Potatoes buried in quantity in fields will be liable to rot *in toto* during the coming winter if, by chance, any infected tubers were buried with the sound ones.

3. Plant next season only tubers which are entirely sound outside and inside. The black spots contain the fungus. Some tubers may appear sound on the sur-

face and be diseased within. Determine the soundness of the tubers by cutting at planting time. To plant diseased potatoes will ensure a continuation of the rot.

4. Even if direction No. 1 has been followed, more or less of the potato fungus will probably remain over winter in the fields, ready to grow if there is an opportunity. Do not, therefore, plant in the same fields as last year, nor in adjoining ones, nor near fields planted by neighbours, if some more remote locality can be found.

5. Take advantage of the prevailing direction of the wind. Our summer and autumn winds are chiefly from points between south and west. There is, therefore, a chance of escaping wind-blown spores by planting to the south-west of other potato fields, or to the north-east of woodlands or other large uncultivated tracts.

6. The growth of the parasite is favoured by moisture and stopped by drought. It is rapid in rainy weather and when there are heavy dews. Usually the rot is much worse upon clay lands or other soils which retain moisture. Choose, therefore, a light and dry soil for planting.

These directions are well considered, in view of what is known of the natural history of the fungus to which the disease is due, and if our farmers and market gardeners will but observe them carefully, the disease may in large measure be abated.

In Huron Districts winter has fairly set in. On the 4th ult. we had snow for two days, the ground well covered, but no frost in the land. A bad prospect for wheat unless the snow keeps loose and not fall much heavier.

The pulse-beat of a healthy horse at rest is forty to the minute, of the ox fifty to fifty-five times, and of the sheep and the pig seventy to eighty times. Any material variation from these figures may be considered as a sign of disease.

To milk a cow before the calf comes is to disturb the natural habit, and bad consequences may follow. When it is necessary to relieve the cow only a very little should be drawn, and the secretion of milk should be discouraged by the use of dry food.

WHAT Henry Ward Beecher once wrote about butter-making in Indiana is not inapplicable to butter-making at the present day in some districts of Ontario—we should not like to say in how many: "Oh for a reformation in the dairy!" exclaimed the preacher.

It is estimated that the cattle range area of the United States embraces 1,365,000 square miles, or forty-four per cent. of the total area of the Union. It is further estimated that 7,500,000 cattle graze on the green plains east of the Rocky Mountains, and that their value is over 200,000,000. English syndicates and English noblemen, it is stated, occupy 21,000,000 acres of this grazing lands, together with the herds thereon.