

parasites have been described in other countries under different names. The organism is carried by the seed exclusively, and it does not live over in the soil as far as is known. When a set which carries the infection is planted, the parasite, under the influence of the moisture and favourable temperature of the soil, sets up a soft rot in it. This is transmitted more or less quickly to the sprouts. If it reaches them before they come to the surface of the ground, cutting off their supply of food before there has been time to develop much of a root system, no plant results. It more often happens, however, that the plant is six inches or a foot high before it shows symptoms of the disease by the rolling of its leaves and by its light green colour. These are invariable signs of the water supply being short, and that is the proximate cause of the symptoms in this case also. In consequence of the disease having taken longer to travel from the set into the base of the shoot, the plant has had time to develop a large root system. Thus, unlike the case of the shoot which was killed as soon as its connection with the set was cut off, the plant is able to live and thrive by drawing on its own roots which are developed above that part of the stalk in which the parasite is. Gradually, however, the rot works upwards, killing off root after root, and slowly starving the plant. The rot travels up as far as the ground level, and sometimes a little above it, and thus cuts off the last root and finally kills the plant.

If death has not resulted before some tubers have been formed the disease is likely to invade them also along the rhizomes. If it does, they generally rot entirely away. Such tubers are not at all likely to be used for seed, but there are other apparently healthy ones which contract the infection from them, or in some other way not well understood, and carry it into storage with them. It is probable that they do so in cuts and bruises which have healed up and in which soil contaminated by tubers rotted by the Black Leg organism has lodged. At the same time the possibility has not been eliminated that, for some reason, the parasite may cease to develop in a tuber and may lie there in a dormant condition until the following spring, although it is usually so virulent that, when it comes into direct contact with the flesh of a potato, it rots it entirely away. The success of the formalin treatment in preventing the disease, even though it must be combined with selection, would seem to indicate that the infection must be carried to a considerable extent externally. It is probable that the parasite does not persist on the unbroken surface of the tuber because it is very easily killed by direct sunlight and drying.

However the details may be, it is certain that infection is carried by the seed. All the sets cut from a tuber which harbours the disease will be almost sure to be infected by the knife, and a large number of the succeeding ones will be contaminated also. The infection thus imparted to a comparatively small number of sets may be spread almost indefinitely, if the cut seed is allowed to stand in bulk and heat even to a slight extent. Such conditions are the most favourable possible for the disease, and it has been shown by experiment that keeping cut seed in barrels for two or three days caused the diseased plants to increase from 15 to 20 plants per acre to 325 plants per acre.*

AMOUNT OF LOSS OCCASIONED.

A conservative estimate of the loss due to Black Leg in 1915 (in which the disease was extraordinarily abundant) in parts of the Maritime Provinces puts the figure at the astounding total of 10 per cent of the entire crop, including diseased plants and misses which could be traced to the disease. *In some cases the percentage of Black Leg plants was very much higher than that, and the total misses were as high as 80 per cent and more.*

These figures are the results of careful counts on more than one hundred farms.

The 10 per cent loss in money estimated above, when applied to the figures of estimated areas and yields of potatoes in the three Maritime Provinces (P.E.I., N.S., N.B.) as given in the November 1915 issue of the "Census and Statistics Monthly" amounts to a grand total of \$696,255, or \$6.65 per acre with an average yield of 133 bushels.

* At the Experiment Station, Orono, Maine.