

## Diseases of Potatoes

By H. L. Rees, Plant Pathologist of the State College of Washington.

**T**HE disease known as black leg was apparently rather prevalent last year in Western Washington, as it is also in the East. This disease is quite serious at times and apparently came to this country from Europe.

**Symptoms**—This disease is characterized by the black, shriveled condition of the stem from the seed pieces to as much as several inches above the ground in some cases. This is accompanied by wilting and dying of the tops, usually rather early in the season. The tubers attached to the affected stems are usually rotted at the stem end if the stem is attacked before the tubers are formed.

**Cause**—This disease is caused by bacteria and in Maine where it has been studied it does not live over in the soil. Whether the climatic conditions in Western Washington make this possible is not known. It does not spread from one plant to another and the only method by which it is known to be spread is by planting diseased tubers.

### Spraying Is of No Value.

**Control and Prevention**—Spraying is of no value at any time. Since it is only known to spread by planting diseased seed, and since it does not spread from hill to hill, only the plants from diseased seed will be affected. To absolutely control this disease plant only clean seed. The method for determining this is as follows: In cutting tubers always make the first cut through the stem end directly through the stem. If any dark, discolored areas show any place in the tuber, especially at the stem end, no matter how slight, discard it. Extra knives and a jar of 4 or 5 per cent formaldehyde solution should be provided and if by chance a diseased tuber is cut, put the knife into the formaldehyde solution and use another knife for the next potato cut. The seed should not be cut until immediately before planting and should not be allowed to stand around in the field for any length of time.

### Silver Scurf Disease.

A new disease of potatoes which was brought to the writer's attention last fall by Dr. Wollenweber of the U. S. Department of Agriculture is the silver scurf disease of potato, known in Europe since 1871, but only in the United States for a short time. This disease, though little known, is apparently becoming widespread in the States and certainly gives indications of shortly affecting nearly the whole of the potato crop. This has never been reported before from Washington nor, to the writer's knowledge, from the Pacific Coast, and seems to be a new disease to this region. However, its presence in Washington and the circumstances connected

with it indicate that it has been present here for several years. A disfiguration and an abnormal shrinkage causes the losses sustained as a result of the attack of the silver scurf.

### Only Affects the Tubers.

**Symptoms**—This disease does not affect the vines, only the tubers. In the early stage of infection under moist conditions dark green or almost black spots appear on the surface of the tuber. Later these spots may enlarge and cover the whole surface of the potato. When dug the affected areas may be circular spots or many may have coalesced, forming one large one, and, as stated, may cover the whole tuber. The affected areas are spotted with fine black points, and may be discolored. At this time a silvery sheen or glistening appearance is apparent and by these two latter characteristics the disease can be easily recognized. As the skin of the tuber in case of severe infections usually the whole tuber will become shrunken and shriveled. Some varieties are badly discolored such as the Leo, Gold Coin, Superlative, others show medium or slight discoloration such as Early Bird, Puritan, Early Acme, Early Rockford and Irish Cobbler.

**Cause**—This disease is caused by a parasitic fungus capable of infecting the tuber at any point. Whether this disease lives over in the soil; how it affects germination, and other questions arising are still open and not settled.

### Concerning the Fungus.

**Control and Prevention**—One thing is known concerning this fungus, however, and that is that the fungus which lives over in the tubers in the sclerotia is not killed by seed treatment. For the present then a careful examination should be made and no affected tuber used for seed. Although at present this disease does not seem to be very prevalent this is probably because it has not yet been recognized by the growers. Because of its possible seriousness careful and painstaking selection is urged.

Out of 76 varieties grown on the Western Washington Experiment Station farm in 1913, 50-60 per cent were more or less affected, some seriously. The seed of these varieties were all treated for scab and that the prevalence of the silver scurf disease was not due to ineffective or improper treatment is shown by the absence of potato scab on the tubers dug at the end of the season. Part of the seed which produced affected potatoes was obtained from the East and part was obtained from strains which had been grown on the station farm for several years. This further indicates the necessity for planting only clean seed.

## The Potato Starch Question

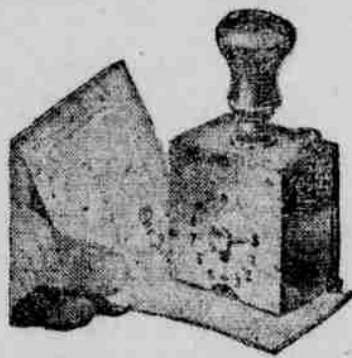
Should Be Fully Investigated as It Is Believed the Industry Would Prove Profitable.

**T**HE value of the potato for manufacturing purposes, particularly for the production of starch and glucose, is one that should be fully investigated, as it is believed such an industry would not only be profitable in itself under Northwestern conditions, but would offer a most valuable outlet for the culls, which are now largely wasted by the Oregon and Washington farmer, and, even more important, would insure a steadier market for the crop each year, regardless of fluctuations in supply and demand for table consumption. In other words, in those favorable seasons when a very heavy crop was produced and the market price was low, or in the seasons when a large portion of the potatoes were culls or not sufficiently matured to sell well for table use, the starch factory would furnish a profitable outlet for the crop. On the other hand, growers who do not care to meet the requirements for producing marketable table potatoes, could raise the later maturing and heavier yielding varieties solely for sale to the starch factory. Even more important than this, would be the fact that potato growing sections of Oregon and Washington which are now distant from the market and must pay a heavy transportation charge on their shipments, could convert all but the very choicest

of their crop into starch in local green starch factories, shipping the green starch to a central refinery, thus reducing transportation charges on the crop as well as securing a profit from the culls.

The starch used in the Northwest, all of which is shipped in from the central states and thus is a tax upon the consumer, might with profit both to the manufacturer and the farmer, be produced here in Oregon and Washington. The Northwest market alone would more than consume all of the starch that a large factory, with its tributary green starch plants, could produce. Experts have estimated that such a factory here could carry on a profitable business and pay the farmer 50 cents a hundred for all of the potatoes he could produce. This price would give the farmer an excellent profit on all of his cull potatoes and a very good profit upon the entire crop if raised for starch manufacture alone. It would also insure a more stable market for table potatoes, as well as a higher grade of the same, thus increasing the shipments to other states. Further, such an industry would bring a superior starch to the consumer, as potato starch is of much higher food value, because of its greater digestibility, than the corn starch now used.

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