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The Agricultural Experiment Station

FORT COLLINS, COLORADO.

POTATO PROBLEMS.*

By W. PADDOCK.

A POOR STAND OF POTATOES.—A poor stand of potatoes is usually due to the attacks of plant diseases of various kinds. Two of these minute plants are quite common; one of them causes the seed potato to rot in the ground, and the other attacks the young shoots, often rotting them off before they reach the surface of the ground. In the former instance it will usually be found that the seed potatoes have been injured by improper storage, thus giving certain fungi an opportunity to develop. With the latter instance, a fungus which is associated with heavy, poorly drained soil is responsible. Such soils should commonly be avoided for potato growing. Potato soil contains more or less sand or gravel and is well underdrained.

VINES AND NO TUBERS.—This condition is a common one in many parts of the state, and is largely due to the attacks of a fungus which thrive best in heavy, damp soil. This condition may not appear every year, but usually it will not pay to try to grow potatoes in a soil where this condition is at all noticeable.

POTATO SCAB.—True potato scab is always caused by the attacks of minute plants, or fungi, and, curiously enough, scab is more common in the best potato soils than it is in localities where the crop is more precarious. Good potato soils, when first brought under cultivation, often give a large per cent. of scabby potatoes

* Because previous Reports on potatoes are out of print, this is prepared to meet inquiries until after the present season.

Nos. 70 and 91, Potato Failures. F. M. Rolf

No. 92, Large Vines and No Potatoes. W. Paddock.

Press Bulletins Nos. 8 and 12, Potato Failures. W. Paddock.

but after one or more crops of alfalfa have been plowed under, this tendency is partially corrected.

In former publications we have advocated the treating of seed potatoes as a means of preventing potato scab. Some of our experiments with treated seed gave good results, but the majority gave negative results. These experiments extended through four seasons at Fort Collins and at Greeley. Our conclusions are, that in these localities it will not only not pay to treat seed potatoes for scab, but that such treatment may positively be detrimental to the crop. Growers on the Western Slope have reported good results from seed treatment; for this reason formulas are given below.

POTATO BLIGHT.—Potato blight, or the dying of the leaves and vines before the crop is mature, is commonly thought to be entirely due to diseases which attack the top of the potato plant. We have not found it so in Colorado. Spraying experiments with Bordeaux mixture did not materially lessen the blight, and the microscopic plants which cause these leaf diseases are not commonly found associated with this trouble. We concluded, therefore, that the premature dying of the potato vines is usually an evidence that the under ground portion of the plants is diseased. Water applied at the wrong time often so favors the development of this disease that the vines may be seriously damaged in a short time.

INTERNAL BROWN SPOT.—A disease which appears to be identical with what is known as internal brown spot has made its appearance in some portions of the state. This trouble appears to be the result of certain conditions, rather than to the attack of any specific plant disease. All that is known on the subject is summed up in the following paragraph, which was taken from Bulletin No. 87 of the Bureau of Plant Industry, U. S. Department of Agriculture.

It is considered not to be a parasitic disease, and no remedy is known and no suggestions are made except the doubtful one of avoiding the use of diseased tubers for seed. In England and Scotland several potato specialists of wide experience gave evidence of like purport. The trouble is frequently observed, and is most commonly called "sprain." It is not propagated in seed or soil and is nonparasitic. It is considered to be the direct result of malnutrition associated with unfavorable soil conditions, resulting either from too dry condition or from the lack of potash or lime. It is frequent in light, dry soils during dry seasons, and is never seen on heavy, strong moist soils. The remedy, in the judgment of the specialists cited, lies wholly in attention to cultural conditions and the choice of varieties.

While the conditions described above do not apply to irrigated land, it will no doubt be found that our trouble is due to some condition of soil or culture, or both, which is unfavorable to the proper development of the potato plant.

SEED SELECTION.—Too much emphasis cannot be given to the importance of seed selection. It should be possible by this means to build up a strain of potatoes which would be adapted to our con-

ditions and which should become better year after year. The following extract is quoted from a former bulletin of this Station:

Another method which gives evidence of considerable practical value is to set aside each year five or ten acres of land for the growing of seed potatoes. The soil of such tract ought to be fertile and free from the various diseases which attack the potato plant. The tubers used in planting the seed tract are carefully selected each year from the seed plot of the previous year. The surplus seed is used for planting the general crop, and in this way a strain of pedigree potatoes is gradually developed.

FORMULÆ FOR TREATING DISEASED SEED POTATOES.

Corrosive sublimate..... 1 ounce
Water..... 8 gallons

Dissolve the corrosive sublimate in one gallon of hot water, then dilute with seven gallons of water. Allow the potatoes to soak one and one-half hours. When dry they may be cut and planted, though it has been found to be good practice to treat the potatoes a week or more before planting, since the treatment may retard germination if done just before planting.

Corrosive sublimate is a deadly poison, and it should be used in wooden or earthen vessels, since it corrodes metals.

Formalin..... 8 ounces
Water15 gallans

Soak the potatoes two hours in this solution, preferably but a short time before planting. This solution is somewhat more expensive than the corrosive sublimate treatment, but it has the advantage of being non-poisonous, and it may be used in any kind of vessel.