Growing Good Potatoes in the Pacific Northwest

Some Ideas on the Homely "Spud" by Men Who Know Whereof They Write.

In this, the sixth and last of a series of articles on potato growing, diseases affecting potatoes in the Northwest are discussed in interesting style.

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THE Colorado potato beetle has at last become established within our state.

For several years this pest has been known to occur in the Nez Perce country in Idaho, the only locality in which it was known west of the Rocky Mountains. In 1910, 1911 and 1912 some few beetles were reported in different parts of Eastern Washington. During the past summer (1913), they have been found quite commonly in many parts of Eastern Washington. In some few places they were very abundant and destructive.

The adult beetle is about the size and shape of half a pea with the round side uppermost. It is yellow in color with the wing covers ornamented with ten longitudinal black stripes (Fig 1). The larva or immature stage is a pale red slug; soft, plump and slimy and very disgusting in appearance. The orange colored eggs are about the size of the head of a pin. They are deposited by

Fig. 1.—Colorado potato beetle; a, eggs; b, larvae; c, pupa; d, adult beetle; e, wing covers of beetle enlarged, showing stripes. All natural size except e. (After Walsh and Riley.)

the female on the underside of the leaves in clusters of from three or four to as many as a hundred. It is not uncommon to find as many as fifty or sixty eggs in a cluster.

Beetles Hibernate.

The beetles live over winter in the adult stage, hibernating in the ground. When the potatoes come up in the spring the beetles emerge from the soil and feed upon the young leaves and vines. They are often seen, however, before the potatoes are even planted. At this time they fly about and mate. After a few days they lay their eggs, and in about a week the eggs hatch out into tiny young plump slugs which grow and develop for about three weeks, when they reach their full size as larvae. They then go into the ground, change to pupae and in about three weeks emerge as adult striped beetles. They soon mate and after a few days the female lays the second crops of eggs which hatch out into a second generation of larvae. A single female may lay several hundred eggs. All stages of the insect may be found at almost any time during the summer. It is not uncommon to find eggs, several different sizes of larvae and adult beetles all on the same potato vine at the same time.

Most of the injury to the vines is done by the larvae, although the adult beetles also feed upon the foliage more or less. The first brood of larvae does the most damage in the eastern part of Washington, although the second brood is much more numerous. This is due to the fact that by the time the second brood of larvae appears in August the potato vines have died from the dry weather and the tubers have gained practically all of their growth. Thus there is little potato foliage left for the larvae to feed upon. This is especially true of those early varieties of potatoes which reach maturity in July. In those district of the state where the vines keep fresh and green throughout the season the second brood of larvae will cause more damage than the first.

Methods of Control.

The ease with which this pest is poisoned is well known to many. There are at least two poisons which, if properly sprayed on to the plants, will give perfect results.

Paris green, one pound to 100 gallons of water, is the most common spray. This spray carefully applied so that the leaves of the plants are thoroughly covered, should kill all of the larvae inside of 24 to 48 hours.

Arsenate of lead, one pound to fifty gallons of water, is also an effective poison. In some ways it is superior to Paris green. It appears white on the leaves, thus serving as a marker, showing where the spray has been applied. It sticks to the foliage much more tenaciously and much longer than Paris green, and even where used much stronger than recommended it will not burn the foliage. The arsenate of lead will also stay in suspension much longer than Paris green and for this reason, if for no other, it is better than the latter.

The Potato Tuber Moth.

For several years the potato tuber moth, or potato worm, as it is also known, has been the worst potato pest in California, where it has done hundreds of thousands of dollars damage annually. During the last couple of years this pest has been found at several places within our state. It has been received in shipments of potatoes from other parts of the country. This is the manner in which it will get introduced into new territory, and every precaution should be taken to prevent its introduction. This insect is not only abundant in California, but is well known in Hawaii, Australia, Algeria and many other countries, including Southern Europe. The same species or one very much like it, is a common tobacco pest in the Southeastern states, where it is known as the "split worm."

The different stages in the life history of this insect are shown in Fig. 2. The adult moth is about one-half inch from tip to tip of wings, and about one-fourth of an inch in length and of a grayish color. The female moth lays about twenty pearly white eggs upon the leaves or upon exposed tubers in early summer, or upon the tubers at digging time. These eggs hatch into tiny pinkish white larvae, which feed upon the leaves, stems or

Fig. 2.—Potato tuber moth. Larvae on the left, cocoons in the middle and chrysalids on the right. Enlarged. (After Essig, Cal.)

tubers, or only upon the tubers when they are stored in the bins during the winter.

Burrowing Through the Tubers.

They burrow all through the tubers, rendering them unfit for food and useless as seed. In from four to six weeks the larvae become full grown, seek sheltered places, spin cocoons about themselves and transform into pupae. In the summer this pupal stage lasts about two weeks and the adult moth appears again and lays eggs for a second generation. The moths live but a few days. By late fall the larvae have developed into the pupal stage, in which state they often remain over winter; adult moths appearing in the storage bins in late winter or early spring. The moths are night fliers, and if the tubers are left exposed over night when dug in the fall the moths take occasion to lay their eggs on them thus causing an infestation in the tubers in storage. The potato tuber moth is very difficult to control, as it is impossible to reach the larvae in their mines in the stems and tubers in the field. This makes it necessary to proceed against them by other methods, of which several should be employed for the best results.

Other Methods.

First. Only those potatoes should be used for seed that are known to be absolutely free from any signs of the pest.

Second. Deep planting and hilling should be practiced to prevent access of the moths to the tubers.

Third. With this, as with most other insect pests, one of the most important measures of control is clean culture. All weeds in and about the potato patches should be destroyed by burning. This practice will eliminate breeding and hibernating places for the insects.

Fourth. Potatoes should be dug as early in the fall as possible, and not allowed to remain in the field over night unless carefully covered, for the moths fly at night and will lay their eggs on exposed tubers.

Fifth. At digging time, all tubers found infected should be put into a bin and fumigated. Infestation can be detected by the presence of the excrement of the moth on the tubers. After the tubers have been carefully sorted and placed in a bin they should be thoroughly fumigated with carbon bisulphide (or bisulphide of carbon, as it is also called), in order to kill the insects present in and on the tubers. Carbon bisulphide is applied by pouring it into flat vessels, such as pie tins or milk pans. An average of three pounds should be used for each 1000 cubic feet of air space in the bin. The pans containing the liquid should be placed on the tops of the tubers, the gas, being heavier than air, penetrates downward through the mass to the bottom. The bin should be closed tightly for twenty-four hours, then opened carefully but quickly and allowed to air for several hours before entering. If not used stronger than here recommended or for a much longer time the fumigation will not injure the germinating power of the potatoes for seed. As the gas is very inflammable, and serious fire or explosion may result, the utmost care should be taken that no fire, such as a lighted match, cigar, electric fan, stove, gas light or lamp should be brought into the vicinity of the gas. The gas is also very poisonous and should not be breathed on any account.

Sixth. Sheep and hogs are valuable for the destruction of such remnants as are likely to be left lying about in the field after digging time and should be turned into the field when the potatoes have been removed.

July Forecasts

The month of July was discovered by Julius Ceasar about 700 B. C. In fact, it wasn't a month. It wasn't even a week, but you know March had Ides and Julius Ceasar finally got one and after rolling the Ide around awhile he decided to call it July, but the poor dagoes never got over feeling sore about him making so hot a month, so they assassinated Julius one time. Julius was all cut up about it, too. He didn't need to take it so serious though, for he was warned to beware of Brutus and his bunch of spaghetti eaters, but he continued to gobble his macaroni out of an Etruscan pie-pan and wipe his hands on his boot tops. But, why weep over this sad event when we stand on the threshold of July and wipe our perspiring brows with a red bandana and kick the dust off our feet on the mat of Time?

On July first the brindle shirt waist will be in full bloom and the soft hearted young lady of the house will seek a place to hang the hammock. The moon will quarter on the first and watermelon will be halved on the 2nd, three quarters will look like a two-cent piece with a hole in it on the 3rd, and most all of the boys will be full on the Fourth, and on the fifth the calaboose will spew out all that's left over. On the 17th Senator Jones and A. Walter Lafferty (A. Walter, did you get it?) will start the fall campaign, and Bill Hanley will spit on his hands and start rustling, which no doubt will bring on heavy rains, thunder, lightning, hail, seismic shocks and a general cataclysm in the neighborhood of Eugene and perhaps "our George" will be forced to tear the Democratic platform all to flinders, and then eat the flinders.

I'd rather be a farmer and work hard all my life,
Than be a politician and undergo such strife.
I'd rather have a cottge, with vines about the door,
A little land to cultivate with no hope of getting more,
Than be a politician and struggle for a place,
With the moocher and the grafter to vex me in the race,
I'd rather sit beneath the tree and live a life obscure,
With children rolling on the grass and happiness secure;
I'd rather listen to the birds and their melodious notes,
Than be a politician and have to beg for votes.
Our wheat is all ripe and ready to mow,
Our taters are in and "Lord" how they grow,
Our apples are green and turning to red,
Our hay is all cut and stacked in the shed,
Our peaches and pears are ripening you see,
The chickens and turkeys are fat as can be,
The farmer rides his auto with money in the bank,
There's not another thing to do except the "Lord" to thank.

On the fifteenth Dr. Littlefield will announce the formula so that all you horny-handed sons of the soil can go out and grow a full sized crab for breakfast while you are milking the cows and greasing the sore shoulder of the mules, but it would do us a darn sight more good if he'd show us how to make a cow we could milk with a faucet. He'd be doing a good turn for the chicken-eating sons of men if he'd make a chicken without a neck and a meatless back. Say, Dr. Littlefield, why not make us a hairless hog and grow us a monkey-wrench to grind the organ and also do to tune up the mower?

I hate to spoil this enlightening epistle, but my duties to the readers of the Farm and Home Magazine Section compel me to tell you that there may never be another July. A flat-nosed astronomer down at Lick observatory will announce the discovery of a new comet about the 12th, with a swallow tail and a crop off the right ear, which is headed in this direction and will strike the earth about July 20th and knock us into smithereens, provided, Mt. Lassen hasn't already sent us to perdition.

I do hope they will put it off until after the Potlatch, for I promised Hi Gill to meet him to the leeward of the Great Totem Pole on the 17th. Let us put our house in order and pay up our subscription to this paper so we can look the comet squarely in the eye and tell it to go to ——, oh well, what's the use.

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