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THE POTATO EELWORM

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The potato eelworm or nematode worm has recently been found infesting potatoes in Oregon. This most serious of potato pests attacks the tuber itself, causing the skin to become roughened and cracked and covered with irregular galls, malformations or pimples over the surface.



Fig. I. Potato showing characteristic pimples caused by Eelworms. (After Doten).

Badly infested potatoes shrivel to one-half the normal size, become soft, lack nutrition and are unfit for human consumption.

Eelworms are not insects. They belong to the round worms or Vermes and are much lower in the animal scale than are insects. They are microscopic in size and their presence can be determined only by the characteristic appearance of the injured tissues. There are very few cultivated crops not subject to attack by this pest. Practically all garden and truck crops, many of the field crops and a great variety of fruit, shade and ornamental trees, shrubs and plants are attacked.

The typical injury is a galling of the rootlets, known as root knot, root gall, etc. These irregular enlargements may occur at any point on the main and lateral rootlets. Affected plants appear devitalized, wilt and die.

The injury to the potato is more obscure but no less serious. The active worms tunnel inside the tissue of the potato tuber to a depth of one-fourth inch or more. Here they form cysts surrounded by an area of brown, dead cells. These appear as brownish rings, corky in texture and with a shiny, pearly white center. The skin of infested potatoes is usually wrinkled, there are irregular sunken grayish areas with a raised center here and there over the surface. Infested potatoes do not always show the same outward signs of infestation. Occasionally seed potatoes in the earlier stages will show no outward indication of injury. Where obscure irregularities occur or where the skin is smooth it is

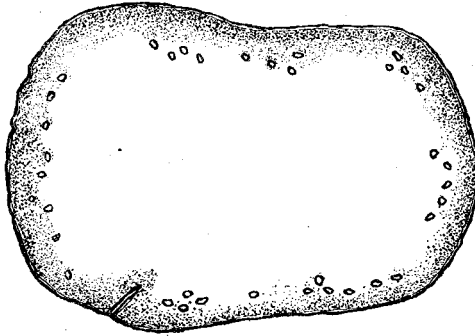


Fig. 2. Cross section of potato showing appearance of eelworm cysts in the tissue. necessary to examine the interior of the potato for the presence of the small brown areas of darkened tissue found at depths varying from just beneath the skin to one-fourth inch in the flesh.

Life History and Description.

The eelworms occur in the infested soil as microscopic, threadlike, active creatures, less than one-twenty-fifth inch long. When plants suitable for attack are present they batter their way to the interior by means of the lance-like arrangement of the mouth parts. When once located within the tissue, they become more or less inactive and commence to feed and grow. The growth is mainly in thickness and but slight in length, thus they gradually assume a spindle shape. After a period of about fifteen days the two sexes begin to show marked differences in form. The female continues to engorge, becoming a turgid, pear-shaped cyst of a glistening pearly white in appearance. The male becomes an active wriggling worm, seeks out the female for mating and then dies. The fertilized female continues to increase in size, her body filled with eggs. These eggs, 400 to 500 in number, soon hatch, the active young worms working out into the surrounding soil to reinfest other plants or locating in new areas in the same plant.

Distribution.

The eelworm is a pest of potatoes in the following localities: 1. In the irrigated sections of Nevada. Here the pest has practically ruined a very profitable industry. 2. In Southern California. 3. Unauthentic records indicate its probable presence on potatoes in Colorado and parts of Utah. 4. Infested potatoes have been received at the Oregon Experiment Station from Coos County, Oregon, near the town of North Bend.

As a field pest of other crops: peaches, tobacco, tomatoes, ginseng, etc., the nematode worm is fairly well distributed over most of the known world. It is a more common pest, in the United States, in the south, but occurs generally east of the Mississippi river and at least occasionally in practically all parts of the country. It is a very common and injurious green-house pest.

The eelworm may be distributed readily to new localities in the soil from infested fields or on the galled roots of any one of the many

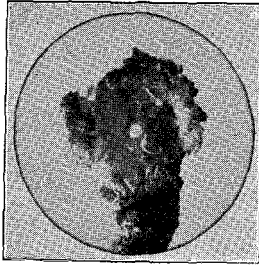


Fig. 3. Eelworm cyst in situ in gall on tomato root, showing characteristic pearly center.

plants it infests. Nursery stock is a common means of distribution. All trees and shrubs should be examined carefully for irregular galls or knots on the roots.

Potatoes afford another ready means of distribution. Seed potatoes in particular constitute a real menace and should be subjected to a most rigid examination. Under no conditions should they be used where obtained from a locality known to be infested with the eelworm.

CONTROL.

If the potato eelworm is once established in a field only the most heroic measures are of avail, and at best total disinfection is probably impossible.

Seed Potatoes. Know the source of your seed potatoes and determine that they are from an uninfested district. Examine the lot carefully for suspicious tubers showing roughened, irregular pimples or galls on the surface. Select several representative tubers from the lot, whether any show outward signs of infestation or not, break them open and examine carefully, (eventually breaking into many small pieces), for small brown spots in the tissue. These will occur at depths varying

from just beneath the skin to one-fourth inch or more, and in size are one-half as big as a pin head, or even less, and with a pearly white center. Do not cut the potato; a knife blade will burst the cyst, which forms the pearly center, and ruin the typical appearance. If suspicious potatoes are discovered, send specimens to the Oregon Experiment Station or to some authority on potatoes, and do not plant seed while even a suspicion of possible infestation remains.

In the Field. It is folly to plant infested soil to potatoes. The crop will be injured and the soil more heavily infested. There are over 500 plants which are hosts for the eelworm. A number of the more common crops are seriously attacked and should, under no circumstances, be planted on infested soil. Therefore,

DO NOT PLANT Field Crops.

Alfalfa	Cowpea	Kale	Sugar beet
Clover, crimson	Field beet	Pumpkin	Tobacco
Clover, red	Field pea	Rape	Vetch
Clover, white	Flax	Soy bean	Ginseng

Truck Crops.

Asparagus	Cucumber	Lettuce	Potato
Bean	Egg plant	Muskmelon	Salsify
Cantaloupe	Beet	Okra	Spinach
Carrot	Garden pea	Onion	Strawberry
Celery	Tomato	Pepper	Watermelon

Trees.

Almond	Cherry	Fig	Peach
Catalpa	Elm	Grape	Walnut

Many others, while not so seriously attacked, should not be used on infested land, if it is desired to lessen the numbers of the pest in the soil.

Fortunately, there are a few crops which may apparently be grown safely on infested soil. While not necessarily entirely immune they are not seriously attacked and are recommended for planting even where it is desired to rid the soil of the eelworm. It is doubtful if total disinfection is possible, but if plants of this class are used in a carefully planned rotation for a three-year period, the pest will be very decidedly reduced in numbers, so much so that potatoes may probably be grown for a year. Therefore,

PLANT

Barley	Peanut	Rye	Velvet bean
Corn	Pearl millet	Sorghum	Wheat
Iron cowpea	Red Top	Timothy	Winter oats

It is believed that the eelworm is not generally distributed over Oregon and it is even possible that the infestation of potatoes is confined to a limited area in Coos county. The pest is too serious for us to allow general infestation of our fields to occur either through carelessness or ignorance. Let eternal vigilance be our aim and let every reasonable precaution be taken to prevent the spread of the pest to new areas.