ROOT KNOT NEMATODE CONTROL IN POTATO FIELDS
Root Knot Nematode Control in Potato Fields

Root knot nematodes have been found in potato fields in several areas of the Columbia Basin. Infected tubers are covered with warty galls that keep the potatoes from being marketable.

Crop rotation and soil fumigation can reduce the nematode population enough so that potatoes may be planted in these fields.

**Symptoms**

It's hard to tell if a field contains root knot nematodes. The vines of infected plants don't show any particular symptoms. The roots of infected plants may have small, inconspicuous galls or knots.

At harvest time, noticeable symptoms appear on the tubers. Severely infected tubers have a rough or warty appearance. They are covered with nematode galls. These galls range up to $\frac{1}{4}$ inch across and may be raised from the surface up to $\frac{1}{8}$ inch.

When the galls are cut open they contain cream colored to dark brown spots, about the size of a pinhead. These spots are the mature females of the root knot nematode. If the potato is heavily infected, the spots may form a ring in the tuber just under the surface.

Soil can be tested for nematodes. Look for small knots on weed roots and have the knots examined under a microscope.

**Root Knot Nematodes**

The root knot nematode is one of a group of microscopic round worms that live in the soil. They go by the common name of nematodes or eelworms.

Nematode eggs overwinter in roots, tuber galls, or in the soil. When temperature and moisture conditions are favorable the eggs hatch and the larvae penetrate the young roots of the host plant.

Each larva forces a spear-shaped feeding tube into a root cell. The larva pumps digestive juices into the cell. These juices stimulate the root cells around the feeding area. Some cells increase in size; others start to divide rapidly and form a root gall.

After a female finds a feeding place, she stays there for life. However she may lay from 500 to 1,000 eggs. During a single growing season, nematodes will go through two or three generations. Normally it is the second or third generation that finds its way into the tuber.

**Cultural Control**

It's practically impossible to eradicate all the root knot nematodes in an infested field. The nematode may be spread by irrigation water, by soil that clings to tools or animals, and by infected tubers or plant roots.

No potato varieties now known are immune. This nematode also attacks many other crop plants and weeds. Those that belong to the grass family are not attacked.

Root knot nematodes may be reduced in number by proper cultural practices. A non-host crop, such as grass or cereal, should be grown for two or three years between each
potato planting. During this time weeds should be kept at a minimum.

Deep plowing in the fall after the potato crop has been harvested will expose infected roots to drying and help reduce the nematode population.

Chemical Control

Soil fumigation has also controlled the root knot nematode. However, soil fumigation is expensive and will not pay unless the crop has a high value.

Telone (1,3-Dichloropropene) can be used at 120 to 202 pounds per acre, as a pre-planting treatment only. Wait two or three weeks or until the odor has left the soil before planting.

DD (Dichloropropene-dichloropropane mixture) can be used at 160 to 250 pounds actual per acre, one week before planting. If soil temperature is below 60°F, use the larger amount.

Work the soil to a fine texture that is free from lumps and undecomposed organic material such as straw. Soil temperature should be between 50 and 80°F at the time of fumigation. Soil moisture should be high enough for the soil to form a loose ball when grasped in the hand. If temperature and moisture are not right, fumigation will not be successful.

Apply the fumigant with chisel applicators spaced at 1-foot intervals and set to inject the chemical at a depth of 8 inches. Follow the applicator immediately with a drag or cultipacker to seal the surface and prevent rapid escape of chemicals from the soil.

Sometimes nematodes in the top inch of soil are not killed. If the soil is plowed and treated a second time the nematodes that escaped the first treatment will be exposed.

This circular was prepared by M. R. Harris, Extension Plant Pathology Specialist, in cooperation with L. R. Faulkner, Assistant Plant Pathologist, Irrigation Experiment Station.

Published and distributed in furtherance of the Acts of May 8 and June 30, 1914, by the Washington State University Extension Service, C. A. Svinth, Director, and the U.S. Department of Agriculture, cooperating. 3M-161