

Potato XXII

Nematodes

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Identification and Life Cycle

Several species of nematodes can cause economic damage to potato in the High Plains production region, including root-knot, root-lesion, and stubby-root nematodes. The life cycle of different nematode species vary, and may include feeding on the outside of roots or penetration and development within roots. Some nematodes vector viruses (stubby-root nematode and Tobacco rattle virus) or predispose plants to other diseases (root-lesion nematodes and potato early dying). Nematodes survive between potato crops by feeding on other crops and weeds, and are spread in contaminated soil on machinery, windblown soil, and infested seed pieces.

Plant Response and Damage

Nematode injury varies among species, but can include galls on roots and tubers (root-knot), necrosis of roots (root-lesion), or a subtle stubby-appearance (stubby-root). Above ground plant symptoms may range from no apparent injury to less vigorous growth to stunting, yellowing, wilting, and death. Some nematodes also feed on tubers directly, causing small, shallow lesions or raised, scab-like lesions (root-lesion), internal brown to black necrotic spots and external raised bumps (root-knot), or brown, necrotic rings that may extend from the periderm to deep within the tuber (stubby-root nematodes carrying Tobacco rattle virus).

Management Approaches

Biological Control

Incorporation of green manure crops such as sudangrass, sesame, rapeseed, white mustard, or perennial ryegrass the season before potatoes are planted can reduce some nematode populations.

Cultural Control

Plant only high quality seed free from nematodes. Crop rotation may provide suppression or control of some nematode species, but most nematodes that attack potato have host ranges that include many crops and weeds. Therefore, effective weed control is essential for reducing nematode populations. Adequate but not excessive irrigation and fertilization will help potato tolerate some nematode feeding. Early harvesting or planting varieties that mature by late July can escape very high root-knot nematode

populations, greatly reducing root-knot nematode damage. Fields with severe root-knot nematode injury should not be stored because the nematode continues to feed on tubers in storage.

Chemical Control

Nematicides and soil fumigation effectively suppress many nematode species, but are most effective when combined with cultural practices that reduce nematode populations. Nematode injury often only occurs in localized areas in fields, and these areas can be effectively managed by spot-treatments with nematicides.

Common/Trade Name	Rate	Remarks
Aldicarb		
Temik 15G NW Lock'n Load	20 lb per acre or 21 oz per 1000 ft of row	Apply granules with the seed pieces in the planting furrow and cover with soil or apply in a 6-inch band and work into the soil or cover with soil into a depth of 4 inches and plant seed pieces in the treated zone.
Ethoprop		
Mocap 10% Granular	2.1 lb banded per 1000 row feet; 60 to 120 lb per acre broadcast	Effective against wireworms and symphylans.
Metam Sodium		
Vapam	40 to 100 gal per acre	Some of the soil properties to consider when determining the application rate include soil texture, percent organic matter and depth of soil to be treated.
Nemasol 42%	30 to 75 gal per acre	Some of the soil properties to consider when determining the application rate include soil texture, percent organic matter and depth of soil to be treated.
Nemasol 426	30 to 75 gal per acre	Some of the soil properties to consider when determining the application rate include soil texture, percent organic matter and depth of soil to be treated.
1,3-Dichloropropene + Chloropicrin		
Telone C-17	10.8-30.0 gal per acre	

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