CLOVER ROOT CURCULIO

Entomology Fact Sheet #1 UI Parma Research and Extension Center February 1997

A serious pest of alfalfa and clover root systems in the Pacific Northwest

The clover root curculio (*Sitona hispidula*) is the most important weevil affecting alfalfa root systems in the Pacific Northwest. It was originally found in Europe in the early 1800's and introduced into the eastern United States in the 1850's. By 1910, it had been reported in many eastern states and the Pacific Northwest. General damage is not widespread, but in some areas of severe infestation, significant losses of quality, stand, and yield may occur. CRC damaged alfalfa stands are also very susceptible to plant diseases that contribute to crop decline. Larvae feeding on roots may contribute to winter heaving and may accelerate the entry of disease organisms such as bacterial wilt and root rots.

Description:

Adult CRC weevils are dark gray to black and about 1/8 to 1/4 inches (3-5 mm) long with a short snout and deeply punctured appearance on the head, thorax, and abdomen. They resemble adult alfalfa weevil but are gray and more slender with a snub nose. Larvae are small white grubs 1/4 inch (6 mm) long with a dark brown head and no legs. They are normally found in the soil close to alfalfa root systems.

Damage:

Adults feed on foliage leaving half-circle shaped holes along the leaf margins. Damage from adult feeding is insignificant on established legumes but may be very injurious to new seedings where springtime damage may result in serious stand loss. The important damage from this pest, however, results from larval feeding on the alfalfa crown and roots. Larvae feed externally causing scoring or girdling of the root. In addition to the mechanical damage, disease pathogens are allowed entry into the plant resulting in bacterial wilt and root rot. Affected alfalfa and clover wilt and often die especially if water stressed. Alfalfa stands where CRC are prevalent often lose productivity much sooner than in fields where the weevil does not exist.

Larval feeding on the main tap root is the most serious damage. This weakens the plant and allows entry to disease agents.

Life Cycle:

Normally this insect overwinters as an adult weevil and lays eggs in the spring, but in some mild seasons, eggs may be laid in the fall or winter and overwinter until spring. Adults become active in the spring and deposit eggs on the soil surface or on the undersides of leaves of alfalfa, clover or other preferred host plants. By May or early June, newly hatched larvae move into the soil where they spend their entire development period feeding on the root

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New seeding fields may suffer serious damage from adult root curculio feeding on young seedlings in the springtime.

system. The larval stage lasts about three to five weeks. Young larvae feed on small roots; more mature larvae chew large holes and grooves in the larger roots. Larvae mature by early summer, pupate in small earthen cells, and emerge as adults by mid to late summer. A complete spring generation life cycle from egg to adult requires about 40 to 50 days. There is one generation per year in Idaho.

Adult weevils actively feed after emergence especially during mating and egg laying when the temperatures are optimal at about 50 to 70° F. Although capable of flying some distance, they usually migrate by crawling from field to field.

Host Plants:

Most varieties of clover and alfalfa are susceptible and may be seriously damaged when conditions are right. CRC are known to occur on other legumes such as lespedeza and soy beans and on some grasses.

Detection

In fields suspected of having CRC, the field should be sampled for damage and presence of larvae once a week during mid-summer. Dig up some plants and check the roots for larval scoring and for root rot in the cavities on the tap root.

Control:

Older chlorinated hydrocarbon insecticides used during the 1940's and 1950's probably maintained this pest at low levels. More recently, the insecticides available to agriculture are not effective. Thus no insecticides are currently registered for controlling this pest. Alfalfa growers must rely on several cultural methods to control this insect and prevent damage.

1. Crop rotation. When CRC are a problem, growers should rotate their fields away from susceptible forage crops more frequently. Avoid leaving alfalfa or clover in a field beyond productive life. A rotation including potatoes or sugarbeets or other cultivated crop will help to eliminate the pest. Soil insecticides applied for wireworms, nematodes, and root maggots during non-alfalfa years may help prevent CRC buildup and damage when alfalfa is again planted.

2. Plowing. Late fall plowing of CRC infested alfalfa or clover will expose the beetles and larvae to killing conditions and natural predators. Late summer or early fall plowing is not as effective.

3. Resistant varieties. When replanting alfalfa or clover, use a variety known to have resistance to CRC attack. Lahontan has shown some resistance to root curculio damage.

4. Chemical control. Soil fumigation is effective but not cost efficient for forage crops. Foliar sprays applied in the spring for alfalfa weevil will kill many CRC adults and exposed larvae, but larvae in the soil are unaffected. Overall, foliar treatments are not effective. Soil insecticides applied during rotation to potatoes, beets, or other crops may help to reduce CRC numbers. There are no soil insecticides registered for use on established alfalfa or clover and would not be effective because of the difficulty of distributing the insecticide in more compacted soils of perennial forage crops.

5. Agronomic Practices. Most CRC damage is noticed as crop wilting or slow growth the first year after fall seeding. Damage is also more prevalent in the new, fast recovering alfalfa varieties. It is

important, therefore, to make sure fertility levels are adequate and the plants are not water stressed during the heat of mid-summer. Stands tend to recover somewhat after this time and May last two to three years before rotating to another crop.

6. Irrigation Management.

Monitor soil moisture and adjust irrigation to prevent over saturation or over dry soils.

Additional Reading:

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