

Quarantine species from the family Curculionidae

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*We present three quarantine pests from the family Curculionidae - *Listronotus bonariensis*, *Naupactus leucoloma*, *Anthonomus quadrigibbus*. All three species are polyphagous and originate from the Americas – the first two from South America, and the third from North America. They are included in Annex II, to Article 3 of Regulation 2019/2072 PART A: Union quarantine pests and their EPPO codes, which are not known to occur in the territory of the EU.*

Argentine stem weevil

Geographical distribution

The Argentine stem weevil (*Listronotus bonariensis*) originates from South America and is distributed in Argentina, Bolivia, Brazil, Chile, Australia and New Zealand, where it is a serious pest of grasses, ornamental plants and sward-forming crops.

Hosts

The main plants attacked by this pest are various species of pasture grasses, of which the most important are *Lolium perenne* (perennial ryegrass) and *Lolium multiflorum* (Italian ryegrass). It is also found on *Anthoxanthum puelii*, *Agrostis capillaris*, *Cyanosurus cristatus*, *Dactylis glomerata*, *Festuca rubra*, *Phleum pratense*, *Poa spp.*, *Zea mays* (maize). *L. bonariensis* also attacks oats, barley and wheat.

Biology

The species usually has two generations per year. Populations of the first generation (spring/early summer) are larger than those of the second (late summer/autumn). Adults overwinter in weed vegetation, but are active and feed on the seeds of host plants on calm, sunny winter days. Oviposition begins at the end of spring. The eggs are laid in small groups of 1 to 3 on the leaves at 5 cm above the soil surface. First-generation larvae have seven larval instars, while those of the second generation have four.

The larvae bore into the stems of the plants and, at the last stage of their development, chew an exit hole and drop into the soil, where they pupate. Pupae can be found from late spring to mid-summer.

Morphology

To the naked eye, adults of this species are quite small and inconspicuous, with a length of only 3 mm and a width of 1.5 mm. Their most distinctive feature is the colour of the elytra, which is a mixture of small, round, flattened waxy scales ranging from white to dark brown, and short, stiff, erect brown setae. The pronotum has three longitudinal pale stripes, one central and two lateral. The smooth, shiny, cylindrical eggs are less than 1 mm long. Larvae vary in size from 1 to 3 mm through the different instars. They are whitish with a brown head.

Means of spread

This pest is spread via seeds of plants from the following genera: *Agrostis*, *Anthoxanthum*, *Dactylis*, *Festuca*, *Lolium*, *Phleum*. Adult beetles are comparable in size to the seeds and therefore cannot be separated by sieving. It has repeatedly been detected in consignments of legume and crucifer seeds and cereals, including *Avena sp.*, *Hordeum spp.* and *Triticum spp.*

Symptoms

Beetles attack the leaves of plants during flowering and fruiting. Narrow, rectangular holes can be seen near the tips, giving a window-like appearance. Sometimes fibrous strips are observed along the length of the leaves. Adults additionally feed on the seeds of various host plants. The larvae bore most often at the base of the plants, more frequently affecting young plants in nurseries.

Control

Chemical plant protection products have no proven effect against this pest. Effective control is achieved by using natural fungal pathogens of the genus *Acremonium* and three parasitic wasps - *Potasson atomarius* (egg parasitoid), *Heterospilus sp.* (larval parasitoid) and *Microtones hyperodae* (adult parasitoid).

White-fringed weevil

Geographical distribution

The white-fringed weevil (*Naupactus leucoloma*) is widely distributed in South America, from where it originates. It causes the most serious damage to plants in North America. It is also found in Australia, New Zealand and Africa.

Hosts

The white-fringed weevil has been recorded on 385 plant species in the USA alone, the most important economically being: *Zea mays* (maize), *Pisum sativum* (pea), *Trifolium spp.* (clover), *Brassica spp.* (cabbage), *Medicago sativa* (alfalfa), *Daucus carota* (carrot), *Fragaria x ananassa* (strawberry), *Rubus spp.*, *Solanum tuberosum* (potato), *Ipomoea batatas* (sweet potato), *Vigna unguiculata* (cowpea), *Vitis vinifera* (grapevine), *Prunus persica* (peach), *Tilia spp.* (lime) and others.

Biology

Male individuals are very rare and have been found only in South America. The species reproduces by parthenogenetic females which, up to 25 days after emergence, lay up to 1500 eggs in groups of 20–60. The weevil overwinters as larvae and eggs in the soil. The larvae pass through 11 instars, with those of the first instar not feeding. The entire larval stage takes place in the soil at a depth of 1–15 cm, but some specimens may burrow deeper. Pupation occurs in oval cells at the beginning of summer. Adults appear at the end of summer.

The elytra are fused and the adults cannot fly. For this reason, they congregate in large groups. Up to 300 individuals can sometimes be found on a single plant.

Morphology

Adults are dark grey with a lighter band along the outer margin of the elytra; their body length is 8–12 mm. The elytra are reduced. The egg is oval, 0.9 mm long, milky white to light yellow. The larval body is 10–12 mm long, yellowish-white, fleshy, curved and sparsely covered with hairs. It consists of 12 segments. The pupa is about 10–12 mm long and whitish in colour.

Means of spread

Adults are highly mobile and can travel up to 1.2 km during their 2–5-month life. They usually attach themselves to hay and other plant material, to vehicles and agricultural equipment being transported. In this way the species spreads to new areas. Adults lay their eggs on all parts of the host plants and remain viable for more than 7 months. Eggs, larvae and pupae can also be transported with soil attached to plants for planting or turf.

Symptoms

Adults feed on foliage around the veins, leaving characteristic strips. Under heavy infestation the damage is severe. The larvae prefer the roots and the base of the stems. They begin their attack from the soil surface down to a depth of about 12 cm. As a result, the plants turn yellow, wilt and die.

Control

Adverse climatic conditions, compacted soil and natural enemies are important factors in controlling *N. leucoloma*. Adult beetles are susceptible to a wide range of insecticides, but control measures should be targeted at the larvae, as they cause the greatest damage.

Apple curculio

Geographical distribution

The apple curculio (*Anthonomus quadrigibbus*) is distributed mainly in North and Central America and Canada.

Hosts

Anthonomus quadrigibbus is polyphagous and attacks mainly woody plants. *Amelanchier alnifolia*, *Cydonia oblonga* (quince), *Malus coronaria*, *Malus domestica* (apple), *Prunus avium* (sweet cherry), *Prunus cerasus* (sour cherry), *Prunus emarginata*, *Prunus serotina*, *Prunus virginiana*, *Prunus virginiana var. demissa*, *Pyrus communis* (pear), *Rosa spp.*, *Sorbus spp.* (rowan), *Cornus sericea* (dogwood), *Crataegus crus-galli* (hawthorn), *Crataegus holmesiana*, *Crataegus macrosperma*, *Crataegus mollis*, *Crataegus punctata*.

Biology

The species has two generations per year. It overwinters as an adult, which appears in spring and feeds on buds and small developing fruits. It prefers to lay its eggs in cherries and less often in apples or pears, but the damage to the latter is significantly more serious. The second generation appears from late July to early September. Adults feed on fruits before seeking overwintering sites near the host trees.

Morphology

Adults are about 5 mm long; reddish-brown, with a long narrow rostrum and four small swellings on the elytra. They are good fliers and feign death when disturbed. Final-instar larvae are the same size as adults, legless, white with a brown head.

Means of spread

The species spreads mainly through host plants for planting and through infested fruits. They can potentially be introduced into Europe via international trade. The similar climatic conditions of North America and some European countries suggest that the species could readily establish permanently in certain areas.

Symptoms

Adults feed on ripening and ripe fruits, resulting in brown spots that may coalesce to form areas up to 2.5 cm in diameter. Eggs are laid inside the fruit and the larvae feed on it, forming galleries under the skin. The fruits lose their commercial value.

Control

Yellow sticky traps are used to determine the flight of adults. The most effective biocontrol agents against the pest are *Entedon trachypterelli*, *Eurytoma pini*, *Habrocytus piercei*. There are no registered chemical plant

protection products, but broad-spectrum contact insecticides applied after flowering give good results. It is essential to destroy herbaceous and weed plants around cultivated orchards.