European and Mediterranean Plant Protection Organization
Organisation Européenne et Méditerranéenne pour la Protection des Plantes

Data sheets on quarantine pests
Fiches informatives sur les organismes de quarantaine

Epitrix cucumeris

Identity

Name: *Epitrix cucumeris* (Harris)
Taxonomic position: *Insecta*: *Coleoptera*: *Chrysomelidae*
Common names: potato flea beetle (English), altise de la pomme de terre (French)
Notes on taxonomy and nomenclature: *E. cucumeris* is one of a group of five flea beetles of the genus *Epitrix* reported to feed on potatoes in North America (Gentner, 1944). *E. tuberis* is already categorized as an EPPO A1 action list pest (EPPO/CABI, 1997)
EPPO code: EPIXCU
Phytosanitary categorization: EPPO A1 action list no. 299

Hosts

In general, *Epitrix* spp. are associated with *Solanaceae*, the adults feeding on the foliage and the larvae on the roots. The main significant host of *E. cucumeris* is potato, but it has also be reported on other *Solanaceae*, such as aubergine, capsicum, tomato and tobacco. *E. cucumeris* and *E. tuberis* are known to prefer potatoes, feeding on other hosts only when potatoes are not available (e.g. after lifting of an early crop). At this stage, the beetles may feed on a great variety of hosts, even non-solanaceous (cabbage, cucumber, *Beta*, lettuce, maize, *Phaseolus*, various weeds).

Geographical distribution

EPPO region: absent
North America: Canada (Alberta, Manitoba, New Brunswick, Nova Scotia, Ontario, Prince Edward Island, Quebec, Saskatchewan), USA (at least California, Florida, Maine, New Hampshire, New Mexico, North Carolina); (Stewart & Thompson, 1989; Bousquet, 1991; Arnett, 2000)
Central America and Caribbean: Dominican Republic, Jamaica, Puerto Rico
South America: Ecuador
EU: absent

Biology

E. cucumeris only has one generation per year. Overwintering adult beetles emerge in spring from the soil, survival depends on the depth and quality of the soil. Unlike *E. tuberis*, adults of *E. cucumeris* do not fly. They feed on foliage of newly emerged plants. After a pre-oviposition period of 5–6 days, eggs are laid over a period of 35–55 days, in the soil, near the base of a host plant. After incubation for 3–14 days, the eggs hatch and the larvae feed primarily on roots for 2–4 weeks. Pupation takes place in the soil, and lasts 7–10 days. At the end of summer, adults emerge from the soil and feed on foliage. The adults later enter diapause to overwinter in the soil, under crop remnants, etc.

Detection and identification

Symptoms

On potato, adults may be found on all above-ground parts of the plant as well as on the soil surface. They feed on both the upper and lower leaf surfaces, but more frequently on the upper leaf surface. Adult beetles cut characteristic shot-like holes (1.0–1.5 mm diameter) in the leaves. Larvae inhabit the soil around potato roots; occasionally, they may enter the tubers, leaving roughened trails or tiny tunnels filled with corky tissue.

Morphology

Eggs
Minute, whitish, spherical.

Larva
Whitish, slender, cylindrical, 5 mm long with a brown head.

Adult
Small black beetles, 1.5–2.0 mm long, jumping like fleas (hence name), with brown legs and antennae. Identification to species is a task for a specialist.

Pathways for movement

All stages are sedentary. While adult beetles could theoretically be carried on rooted host plants, this possibility hardly arises in practice. Larvae could be present in potato tubers, or, more likely, in soil adhering to tubers. The most probable means of international spread would be pupae or diapausing adults in

soil. It may be noted that *Epitrix* spp. have not so far been detected in consignments, either national or international.

Pest significance

Economic impact

Crop injury results from adults feeding on leaves, larvae feeding on roots and from transmission of pathogens. It should be noted that larvae of *E. cucumeris* feed on potato roots rather than tubers (Hill & Tate, 1942). The adult beetles eat characteristic shot-like holes in potato leaves. Significant negative correlation has been demonstrated between yield and beetle numbers, and between yield and numbers of leaf holes (Granovsky & Peterson, 1954); therefore, adult feeding can be economically significant. In spring, damage is generally not significant because measures applied against other pests will control *E. cucumeris*. However, late-season feeding can cause significant damage in places where no insecticides are applied at that time against other pests. Yield losses up to 20% have been reported. Finally, pathogens of potato, such as *Verticillium dahliae*, *Fusarium coeruleum* and *Thanatephorus cucumeris* are reported to be associated with *E. cucumeris*.

Control

Specific chemical control against *E. cucumeris* is uncommon. Adults are generally controlled by insecticides applied against other pests, in particular *Leptinotarsa decemlineata*, and *E. cucumeris* is therefore easily controlled. Occasionally, specific spray treatments are applied against adults when a threshold is reached. It should be noted that DDT resistance appeared rapidly in the USA after 5–6 generations (Kring, 1958), so similar problems may arise with the more modern insecticides. Cultural methods may favour control, such as keeping the fields free from weeds which can host the pest, and destroying plant residues to hamper survival during overwintering.

Phytosanitary risk

The very wide distribution of *E. cucumeris* in America indicates that it could readily find suitable climatic conditions in the EPPO region. One could expect it to establish in many of the potato-growing areas of central and northern Europe. *E. cucumeris* causes less direct damage to potato than *E. tuberis* but is nevertheless a significant pest. Control measures against either or both these pests could lead to a generalized use of insecticides on potato, rather than occasional targeted use against *L. decemlineata*, as at present. The problem would arise even more acutely in countries where *L. decemlineata* has not been introduced.

Phytosanitary measures

In general, most EPPO countries prohibit the import of soil, and restrict the import of plants with soil (OEPP/EPPO, 1994), from other continents. This measure should be effective against *E. cucumeris*. Concerning seed potatoes and ware potatoes, EPPO Standard PM 8/1 (OEPP/EPPO, 2004) recommends, for imports from countries where *E. cucumeris* occurs, freedom from plant debris and from soil (to a tolerance of 0.1% for seed potatoes and 1% for ware potatoes).

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