

Data Sheets on Quarantine Pests

*Pissodes terminalis***IDENTITY**

Name: *Pissodes terminalis* Hopping

Taxonomic position: Insecta: Coleoptera: Curculionidae

Common names: Lodgepole terminal weevil (English)

Bayer computer code: PISOTE

EPPO A1 list: No. 258

EU Annex designation: II/A1 - as *Pissodes* spp. (non-European)

HOSTS

P. terminalis is confined to coniferous trees and attacks mainly lodgepole pine (*Pinus contorta*). Other hosts are the widespread jack pine (*P. banksiana*) and the local western species bishop pine (*P. muricata*) and Monterey pine (*P. radiata*).

GEOGRAPHICAL DISTRIBUTION

EPPO region: Absent.

North America: Canada (Alberta, British Columbia, Saskatchewan), USA (California, Colorado, Idaho, Oregon, South Dakota, Wyoming).

EU: Absent.

BIOLOGY

In Colorado (USA), the adult is found on new terminal growth of *P. contorta* from June to July and feeds on new shoots (leaders 25 cm long, secondary shoots, needles and 2nd-year conelets about 1.25 cm in diameter). Eggs are laid in elongating leaders (Cameron & Stark, 1989) from early June to the end of July. They hatch in about 2 weeks and larvae mine just below the epidermis, destroying the cambial area. By the end of August, larvae have moved to the pith. There are four larval instars. Larvae overwinter in the pith and finish development, pupating the following spring. The length of the life cycle of the beetle is, however, dependent on altitude. At altitudes over 2500 m the life cycle takes 2 years to complete, while at lower altitudes some complete their developments and emerge as adults in the autumn (Cameron & Stark, 1989). Kovacs & McLean (1990a) have studied the biology of *P. terminalis* in British Columbia.

DETECTION AND IDENTIFICATION**Symptoms**

Mainly trees 2-6 m tall are attacked. Symptoms are first apparent in the late oviposition period, when the needles are elongating. In mild attacks, only the terminal bud is killed and this is almost impossible to detect in the year of attack. Close scrutiny will reveal the feeding punctures. Egg punctures are noticeable because of the presence of resin droplets

and necrotic tissue. However, a microscope is necessary to observe the eggs. Initially, larval mines fill with resin, and needles appear purplish in contrast to the pale-green healthy shoots. Crooks and forks in the stem are evidence of attacks in previous years, but these gradually straighten out, especially since trees are not normally attacked in successive years. If a tree is attacked in successive years, then multiple leaders develop and the tree eventually dies.

Morphology

Eggs

Subglobose, 0.5 x 0.8 mm with a thin, translucent chorion.

Larva

Creamy-white with tan head capsule, 1-3 mm longer than the adult when fully developed.

Pupa

Creamy-white, about adult size.

Adult

Mottled yellowish-brown, 5-7 mm long.

MEANS OF MOVEMENT AND DISPERSAL

The natural spread of *Pissodes* spp. is determined by the flight performance of the species which seems to be not more than 100 km. International spread would most probably occur via the shipment of living conifer plants, including Christmas trees. *P. terminalis* only attacks young growth and is unlikely to be carried by wood.

PEST SIGNIFICANCE

Economic impact

In the late 1960s, *P. terminalis* was causing serious damage on regrowth of *Pinus contorta* and in young plantations in western North America. If the forest is managed for production poles or saw-logs, then weevil impact is not detrimental since, by the time trees attain full size, evidence of damage disappears. For quality Christmas trees, however, even light weevil damage is unacceptable. Thus, the pest status of this species depends largely on the objectives of the resource manager.

Control

Control is generally not necessary in well managed forests for wood production. In Christmas tree nurseries, it may be necessary to use insecticide treatments. Parasitoids of *P. terminalis* have been indicated by Kovacs & McLean (1990b).

Phytosanitary risk

P. terminalis is an EPPO A1 quarantine pest (OEPP/EPPO, 1980), but no other regional plant protection organization has cited it as a quarantine pest. Its main host, *P. contorta*, is planted to a certain extent in northern Europe, as is also its subsidiary host *P. radiata*, and it could very probably establish on these species under European conditions. However, *P. terminalis* is cited much less frequently in the North American literature than the much more important *P. strobi* (EPPO/CABI, 1996b), occurs over a much smaller area, and has a much narrower host range than *P. nemorensis* (EPPO/CABI, 1996a), so it does not obviously have potential to spread to other species or cause more extensive damage. To that extent, it presents a relatively moderate risk to the EPPO region.

PHYTOSANITARY MEASURES

To prevent the introduction of life stages of *P. terminalis*, EPPO recommends that the importation of plants and cut branches of host species of *Pinus* from North America should be prohibited (OEPP/EPPO, 1990). There is also a minor risk from conifer wood, which is effectively covered by the measures recommended by EPPO (OEPP/EPPO, 1990) for non-European Scolytidae (EPPO/CABI, 1992).

BIBLIOGRAPHY

- Cameron, E.A.; Stark, R.W. (1989) Variations in the life cycle of the lodgepole terminal weevil *Pissodes terminalis* in California. *Canadian Entomologist* **121**, 793-601.
- EPPO/CABI (1992) Scolytidae (non-European). In: *Quarantine pests for Europe* (Ed. by Smith, I.M.; McNamara, D.G.; Scott, P.R.; Harris, K.M.). CAB International, Wallingford, UK.
- EPPO/CABI (1996a) *Pissodes nemorensis*. In: *Quarantine pests for Europe*. 2nd edition (Ed. by Smith, I.M.; McNamara, D.G.; Scott, P.R.; Holderness, M.). CAB INTERNATIONAL, Wallingford, UK.
- EPPO/CABI (1996b) *Pissodes strobi*. In: *Quarantine pests for Europe*. 2nd edition (Ed. by Smith, I.M.; McNamara, D.G.; Scott, P.R.; Holderness, M.). CAB INTERNATIONAL, Wallingford, UK.
- Kovacs, E.; McLean, J.A. (1990a) Notes on the longevity, fecundity and development of *Pissodes terminalis* Hopping (Coleoptera: Curculionidae) in the Interior of British Columbia, Canada. *Journal of the Entomological Society of British Columbia* No. 87, 68-73.
- Kovacs, E.; McLean, J.A. (1990b) Emergence patterns of terminal weevils (Coleoptera: Curculionidae) and their parasitoids from lodgepole pine in the Interior of British Columbia, Canada. *Journal of the Entomological Society of British Columbia* No. 87, 75-79.
- OEPP/EPPO (1980) Data sheets on quarantine organisms No. 44, *Pissodes* spp. (non-European). *Bulletin OEPP/EPPO Bulletin* **10** (1).
- OEPP/EPPO (1990) Specific quarantine requirements. *EPPO Technical Documents* No. 1008.