THREAT DATA

Pear fruit moth

(Acrobasis pyrivorella)

(Ref. http://www.padil.gov.au/viewPestDiagnosticImages.aspx?id=512)

CRC10010

Enhanced Risk Analysis Tools

Pear fruit moth

(*Acrobasis pyrivorella*)

Pear fruit moth, also know as pear moth (*Acrobasis pyrivorella*). It has a number of synonyms in the literatures. Pear moth is very restricted to pear plant and is one of the destructive pests for pear industry in Russia where up to 90% crop damage reported in the literature (Shutova 1970).

Distribution: Pear moth is widely distributed in the temperate zone of Asia. Specially in Japan this pest is found in all pear growing regions. In China it occurs in a number of provinces. Similarly in Russia, it is limited to a number of provinces. The pest has not been reported in Australia, New Zealand, North America, Europe and Middle East.

Host range: Pear moth has very restricted host range that includes only pear such as *Pyrus communis* (European pear) and *Pyrus pyrifolia* (Oriental pear tree). There is no indication that the moth attacks fruit trees other than *Pyrus sp.* (Shutova, 1977).

Affected Plant Stages: Fruiting stage.

Affected Plant Parts: Fruits/pods and inflorescence.

Biology and Ecology: Pear moth overwinters as first-instar or second-instar larvae in flower buds within a thin white cocoon (Shutova, 1970; Gibanov and Sanin, 1971). The infested buds do not fall, but remain on the tree without developing. In spring, the larvae emerge and move to fresh buds. It feeds on the developing buds, flowers and fruitlets. Larvae move from fruit to fruit and a. single larva can infest and destroy two to three buds, one to three primordial flowers and up to three fruits (Shutova, 1977). The older larvae penetrate into the developing fruit around the stalk to pupate. The larvae generally enter the fruit near the calyx end or on the side of the fruit, making a prominent hole with an overhanging lip of silk and excreta. The moths lay eggs (about 120 per female) near new flower buds. The larvae hatch and penetrate the buds to form the overwintering cocoons after a week. The biology and ecology of the pest varies depending on climatic conditions. Fruits that have been infested by larvae remain black and shrivelled on the tree.

Symptoms: Fruit infested with pear moth are normally retarded in growth and turn black with a shrivelled appearance. Furthermore, the shrivelled fruits remain on the tree until the following year (Shutova, 1977). In summer, the entry holes of the pest are characteristic. They are most often placed at the calyx end or side of the fruit, with the upper side of the opening marked by an overlapping lip of accumulated excreta (Shutova, 1977). Unable to find any photo of the damage symptoms associated with this pest in literature.

Pest Movement and Dispersal: The natural spread of *A. pyrivorella* by adult flight is over relatively short distances. The main means of spread would be international trade of planting material with infested buds (Shutova, 1977). Both infested plant materials and fruits liable to carry the pest in trade/transport

Resistant plant variety: No report is available in the literatures on resistant plant variety against the pear moth.

Natural Enemies: Number of natural enemies for pear moth listed in CPC without further details of their effectiveness in the field.

Economic impact: Pear pest is considered to be one of the major pests for pear in the Far Eastern territories of Russia, *A. pyrivorella* is rated as the most serious pest of cultivated pears, and damages up to 90% of pear crops (Shutova, 1970). It is also considered to be of economic importance in Japan (Siezo, 1968).

Management: In Japan, *A. pyrivorella* is controlled by applying fenitrothion, diazinon, cyanophos or methidathion shortly before flowering and two later applications between June and August, depending on the developmental stages of the pest (Umeya, 1980). In Russia, the latest insecticidal application is recommended for mid-August (Komarova, 1984). Forecasting systems are being developed in China (Geoffrion, 1987; Feng, 1997). Biological control has not been thoroughly researched, although Meteorus colon has been reported to parasitise *A. pyrivorella* up to 57% in Russia (Komarova, 1984) and several ichneumonids in China (Xing et al., 1986). In China, fruits are individually wrapped in paper to exclude the pest. However, in certain parts of the trees the fruits remain unwrapped and serve as bait-fruits which are destroyed after infestation (Shutova, 1977).

Phytosanitary Risk: Pear pest presents a risk to all pear-growing regions in other continents. It is included in the EPPO A2 list of quarantine pests (OEPP/EPPO, 1999), though not listed as a quarantine pest by any other regional plant protection organisation. In Russia, *A. pyrivorella* is considered to be capable of survival wherever pears are grown (Shutova, 1977), and is treated as an internal quarantine pest. Measures taken against *Carposina sasakii* (EPPO/CABI, 1996a) would adequately cover *A. pyrivorella*.

Probabilities of Entry: Low - *A. pyrivorella* can enter into Australia mainly through infested plant parts (mainly buds) but under proper quarantine it has low possibility of entry into the country.

Possibility of Establishment: Low –apart from pears growing regions, the pest has low potential to establish in Australia due to its restricted host range.

Quarantine Risk: Low – because of low potential of entry and establishment of the pest. If established, the pest has also low potential to spread in other pears growing regions in Australia due to its relatively short distance flight capacity.

Economic Impact: High - based on pest biology and the damage severity reported in published literatures by *A. pyrivorella*. Unavailability of any pest resistant plant variety is also an important issue in economic impact.

Environmental Impact: Low – very restricted host capacity of *A. pyrivorella* is consider requiring less chemical application for its management i.e. less environment pollution.

Social Impact: Very low – since pear is only known fruit plant affected by *A. pyrivorella* and a proper control measure is also available. Therefore, social impact consider very low due to the presence of this pest

Pest Management cost: Low/moderate – depending on pest severity the management cost may vary. Based on literature the annual application cost for chemical control of this

pest is about **$450/ha for 3 spray** (chemical cost ~$100/ha plus labor and machinery cost ~$50/ha for a single spray as suggested by Martine Combret, Development Officer, DAFWA). This cost excludes involvement of any biological control and resistant plant varieties. Effective and established control practices (both cultural and chemical) are available for *A. pyrivorella*. However, the management with cultural practice could be more expensive in case pest severity.

Yield loss despite control efforts: Based on pest biology, available control measures, and its impact on the host plant the total yield loss assumed to be between 15 – 25% under proper control measures.

Export revenue loss due to loss of Pest Freedom Status: Low – due to very restricted host capacity and low dispersion possibility of *A. pyrivorella* through fruit during international trade.

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