

PEST AND DISEASE (EXOTIC) INFORMATION BULLETIN



Chestnut gall wasp (Oriental or Asian)

Scientific Name: *Dryocosmus kuriphilus* Yasumatsu (Hymenoptera Cynipidae)



Adult Asian chestnut gall wasp. Photo: Gyorgy Csoka, Hungary Forest Research Institute, Bugwood.org

The chestnut gall wasp *Dryocosmus kuriphilus* is a global pest of chestnut (*Castanea*). The Chestnut gall wasp is native to Asia and established as a pest in the mid 20th century in Japan, Korea, USA (1974) and Europe.

Chestnut gall wasps are a potentially devastating invasive pest that can infest all species in the genus *Castanea*, including ornamental species and those planted for nut production.

Dryocosmus kuriphilus is considered to be one of the greatest causes of damage to the species of the genus *Castanea* at a worldwide level and is classified by the European and Mediterranean Plant Protection Organization (EPPO, 2005) as a quarantine organism. It is a pest of Chinese origin which attacks exclusively chestnut trees inducing the formation of galls on new spring shoots, thus disrupting twig growth and resulting in severe plant decline and drastic yield reductions (Kato and Hijii, 1997). The larvae feed within the galls in spring, the adults emerge in summer and lay their eggs inside the buds, in which the first instar larvae overwinter until the following season (EPPO, 2005), making detection difficult by simple external plant inspection. In Japan, Korea and the United States, countries where the gall wasp was introduced accidentally and has been widespread for sometime (Rieske, 2007), it has caused vast damage to chestnut growing. More recently



D. kuriphilus has been detected in Nepal (Abe *et al.*, 2007) and also in Europe: first in Italy in 2002 (Brussino *et al.*, 2002) and three years later in Slovenia (Seljak, 2006) and France (EPPO, 2007).

The distribution of this pest is primarily due to the transport of infested seedlings to new areas and the exchange of infested scion wood used to graft new trees.

BIOLOGY AND LIFE CYCLE

- Female adult wasps, one-eighth-inch long, lay three to five eggs in a cluster inside chestnut buds.
- Multiple adults may oviposit in a bud, with as many as 25 eggs per bud.
- Eggs hatch in 40 days and the larvae remain dormant until bud break the following spring when they induce the formation of galls on developing plant tissues.
- Larvae feed on the inner gall tissue for 20 to 30 days before pupating.
- Adult wasps emerge from the galls and the dispersal by wasp flight has been at a rate of 23 km per year, however, dispersal of adult insects has been augmented by prevailing winds.
- The emerging adults locate new chestnut shoots, laying eggs for the next generation.
- After the wasps emerge, galls become woody and dry out, potentially persisting on the tree for several years.
- The gall wasp produces one generation per year via asexual reproduction.
- Galls can form on the stem, petiole or leaf and provide the larvae and pupae protection.
- As you cannot detect the buds where eggs have been laid, the movement of all chestnut materials - except seed - between orchards, including scion wood and seedling rootstocks, should immediately cease.
- It is known that the cultivar 'Bouche de Betizac' is the only chestnut cultivar completely immune to Asian chestnut gall wasps.

TREE DAMAGE

Chestnut gall wasps cause globular twig, shoot and leaf galls on actively growing shoots, leaves or petioles of all *Castanea* species. These are usually green in early spring, turning red or rose-coloured in late spring and early summer, then drying out and becoming woody and brown from late summer.

This insect pest lays eggs in the buds of chestnut shoots, and galls develop on the shoot tips, leaves and catkins. Galling reduces fruiting and nut yield, suppresses shoot elongation, reduces tree vigour and wood production and can kill trees. Galling also prevents infested shoots from producing new shoot growth and flowers, thereby reducing or eliminating future production.

After adult insects emerge, the dried, blackened galls become woody and can persist on older limbs for several years. In cases of severe infestations, interior portions of the tree canopy die and trees are killed.

Previous seasons' woody brown galls can be found at any time of year, especially if they formed on the petioles. Galls can grow to 4cm (1.75 inches) in diameter, although most are been between 1 and 2cm.

TREATMENT

Control options include insecticide treatment. However, insecticide treatment of widespread outbreaks in the wider environment is unlikely to be effective because the galls encase the larvae, protecting them from chemical treatments.

An option in localised outbreaks is to conventionally harvest affected trees by felling or coppicing them and burning, deeply burying, or mulching (branch and tree-top material).

In the long term there could be the possibility of using a parasitoid organism to achieve a measure of 'biological control', but this would need careful research beforehand to ensure that the control organism itself would not cause environmental damage.



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