Japanese Maple Scale (*Lopholeucaspis japonica*): A Pest of Nursery and Landscape Trees and Shrubs

**Introduction**

Over the past several years the exotic Japanese maple scale (JMS), *Lopholeucaspis japonica* (Cockerell) (Hemiptera: Diaspididae), has become a pest insect of major concern to nursery crop producers and landscape managers in MD and the eastern U.S. JMS is difficult to control and monitor due to its wide host plant range (over 45 genera of plants in 27 families), extended crawler emergence period, and its small size and somewhat cryptic coloration. Unless monitored carefully and controlled early, populations of this armored scale can spread throughout a nursery or landscape to many species of woody plants and build up to levels that cause dieback and even death of infested plants. The first U.S. detection of JMS was in CT in 1914 (Miller et al. 2005), and it has since been reported in Washington DC, and 15 states (AL, DE, GA, IN, KY, LA, MD, NC, NJ, NY, OH, PA, RI, TN, and VA) (Miller and Davidson 2005). JMS is not a quarantine pest on the east coast but several states in the mid-west have quarantines on JMS and states known to receive infested plant material have rejected shipments.

**Identification In The Field**

JMS is a member of the armored scale family Diaspididae. The presence of a waxy cover that is not attached to the soft body underneath is a good field characteristic to distinguish armored scales from other families of scales. JMS is one of the smaller armored scale pests of ornamentals with adult female covers only ~1 mm in length. The cover of JMS is irregularly oystershell shaped. Adult females have a thicker, dark brown cover (pupillarial) that is the enlarged second-instar shed skin that is entirely covered with white wax. When the white wax is rubbed, or treated with oil, the brown cover appears. Since the newly formed outer cover is white, this pest is relatively easy to see on dark bark plants but harder to see on trees with light bark. The male and female covers look very similar.
Eggs, soft bodied immatures and adult females under the wax covers are usually light purple, sometimes yellow-white in color. Newly emerged crawlers are extremely small, oval, and purple. Within hours of emergence crawlers settle on the wood and begin to produce a light covering of white wax (settled crawler). JMS is normally on the bark, both trunk and branches, of host trees but in heavy infestations have been observed on leaves.

**Life Cycle**

The limited published literature on JMS indicates there is one generation per year in cold climates such as Northern Japan and Pennsylvania, where fertilized females overwinter. In warmer climates such as Maryland and Virginia, two generations per year with second instar males and females overwintering were reported (Miller and Davidson 2005). Research in MD conducted in the last two years (2009, 2010) has further examined the life cycle of JMS. Studies confirmed in Maryland that JMS has two generations per year and overwinter as immature 2nd instar males and females. In the spring, JMS continue to develop and mate. Adult females with eggs are seen in late April to early May. Egg laying and crawler emergence periods extend over long periods of time (see table) making management of JMS challenging. The table below lists crawler activity period, and the Degree Day (DD) accumulations (using base 50°F from Jan. 1; averaged over 4 years for 1st generation crawlers and 2 years for other DD estimates) for the beginning of crawler activity and peak crawler activity. These degree days occurred around mid May / early June for 1st generation and August for 2nd generation.

<table>
<thead>
<tr>
<th></th>
<th>1st Generation</th>
<th>2nd Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start (DD)</td>
<td>806</td>
<td>2220</td>
</tr>
<tr>
<td>Peak (DD)</td>
<td>1144</td>
<td>3037</td>
</tr>
<tr>
<td># Weeks Active</td>
<td>7.5</td>
<td>8.5</td>
</tr>
</tbody>
</table>

*Cotinus coggyria* (Smokebush) and *Syringa chinensis* (Chinese lilac) were in full bloom at the time of first generation crawler activity and can be used as phenological indicators. *Aralia spinosa* (devil’s walkingstick) was in bud at the time of second generation activity.

**Damage and Monitoring**

Scales are sucking insects that remove plant sap. High populations can cause premature leaf drop, branch dieback, and ultimately tree death. In addition, white scale covers that accumulate on the bark and branches of plants often remain for a period of time following control measures, are unsightly,
and have led to rejection of plant shipments. Monitor potential hosts closely for JMS and try to identify infestations early. Examine plants showing any level of leaf loss or dieback. Light infestations often start in the cracks and rough areas of the bark and branches. Look on bark for the small white, elongate, narrow scale covers. To determine if the scale is JMS gently rub the white wax to expose the underlying dark brown second instar shed skin, and using a hand lens or microscope squish or flip off the scale covers to look for signs of the purple soft bodied insect or eggs. When nearing the appropriate DD for crawler activity closely monitor for signs of crawlers. Look for discrete circular holes in scale covers that indicate parasitoids are attacking the JMS population.

**Management**

**Mechanical:** Use a high pressure water spray or gentle scrub brush with water to remove scale covers from trunks of trees to improve aesthetic appearance and/or reduce populations. Prune out dead branches with scales.

**Chemical:** Dormant applications of horticultural oil should be applied at 2-3% rates in the fall after leaves drop or in spring before bud break. If applying in fall or spring, apply when temperatures are above 50-60 °F for 4 to 5 days. During the growing season target the crawler stage for optimal control. See the degree day crawler activity table above. Horticultural oil at a summer rate of 2.0 % can be applied when crawlers and early instars are present. Do not apply horticultural oils to drought stressed plants. When crawlers and early instars are present and at peak activity, one of the two insect growth regulators (IGRs), pyriproxyfen (Distance) or buprofezin (Talus) can be applied. The addition of 0.5 or 1% horticultural oil has been shown to improve coverage. The IGRs will prevent the crawlers or early instar stage from developing into the next instar stage, resulting in death of the insect. IGRs are slow acting so be patient. Two to three applications may be necessary. Studies at UMD have evaluated two systemic neonicotinoid insecticides, dinotefuran (Safari, Transect) and clothianidin (Arena). Arena provided faster and somewhat greater control than Safari. Systemics should be applied at the very first sign of crawler activity and should provide control of 1st and 2nd generation JMS. Arena is labeled for landscape use only, Safari is labeled for landscape and nursery use. Follow use limits on the label. Read and follow the label directions of pesticides carefully.

**References**


---

**Japanese Maple Scale (Lopholeucaspis japonica): A Pest of Nursery and Landscape Trees and Shrubs**

by

Stanton Gill, Extension Specialist, IPM for Nurseries and Greenhouse, Central Maryland Research and Education Center, University of Maryland Extension, Ellicott City, MD, sgill@umd.edu

Paula Shrewsbury, Extension Specialist, Department of Entomology, University of Maryland, College Park, MD, pshrewsb@umd.edu

John Davidson, Professor Emeritus, Department of Entomology, University of Maryland, College Park, MD

---

The information given herein is supplied with the understanding that no discrimination is intended and no endorsement by University of Maryland Extension is implied. Read labels carefully before applying any pesticides.

University of Maryland Extension programs are open to all citizens without regard to race, color, gender, disability, religion, age, sexual orientation, marital or parental status, or national origin.

---

June 2012