



Original thinking... applied

Nursery pests and biosecurity

UKOTCF Conservation Horticulture
Working Group

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Fera Science Ltd

- To support and develop a sustainable food chain, a healthy natural environment, and to protect the global community from biological and chemical risks
- Joint venture between Bridgepoint & Defra
- Over 550 staff
- One of the UK National Reference Laboratories for Plant Health
- Provides diagnostic services for pests and diseases, scientific evidence to protect crops and the wider environment, and supporting official regulatory controls
- Working in collaboration with all the UKOTs for 15 years



Introduction to invertebrate plant pests in the UKOTs

- Plant nurseries in the UKOTs range from commercial, non-commercial government, to specialist nurseries growing endemic plants
- Every OT is unique and will have different pest priorities
- Climatic range across the UKOTs spans from polar and sub-polar conditions to tropical
- New plant pests are recorded every year
- Some pests are common to most territories
- Climate change is likely to enable more species to establish, weaken plants making them more susceptible, and pests may have a bigger impact
- Climate change increases uncertainty with risk assessments



Types of plant damage

Symptoms are often observed before finding the pest

- Chewing/ rasping
- Sucking
- Tunnelling or boring
- Puncturing - feeding or oviposition
- Gall formation
- Contamination with frass, honeydew, wax, silk, webbing, shed skins etc.
- Vectoring and disease transmission



Detection

- Many pests are small, difficult to see and may be overlooked (thrips, mites, scales)
- Often hidden on the lower leaf surface or at the base of the leaf sheaths
- Some feed inside the plant (wood boring, leaf miners)
- The main feeding stage for insect pests is often immature (caterpillars/worms, larvae)
- Many are nocturnal (feeding at night)
- Many pests feed on the roots (root mealybugs, weevil larvae)
- A hand lens or magnifying glass is very useful.



Main groups of arthropod plant pests

- Mites
- Insects – 5 orders contain most plant pests
- Hemiptera
- Lepidoptera
- Coleoptera
- Diptera
- Thysanoptera



Hemiptera

- Whitefly, scale insects, psyllids, hoppers, lace bugs, true bugs
- Comprises ~80,000 to 110,000 described species
- Sucking mouthparts
- Majority are plant feeding
- 1mm (0.04in) - 12cm (6in)
- Wings held tent-like or flat over the abdomen
- Forewings usually harder than hindwings
- Direct damage – chlorosis, reduced host vigour, host mortality
- Indirect damage - Waxy deposits, honeydew, sooty mould, disease (many are vectors)



Lepidoptera

- Butterflies and moths
- Comprises ~180,000 described species
- 2mm – 45cm wingspan - Average 2.5cm (0.9in)
- 2 pairs of membranous wings
- Wings & body covered in scales
- Adults have sucking mouthparts
- Larvae (caterpillars or worms) have chewing mouthparts
- Most are plant feeding
- More likely to encounter the larvae in nurseries



Coleoptera

- Beetles
- Comprises ~400,000 described species
- 0.8 mm to 17cm (6.5in)
- Biting mouthparts
- Forewings form 'elytra' that generally cover abdomen
- Membranous hindwings
- Forms adapted to most ecological niches
- Larvae of many species feed on roots or tunnel in wood



Diptera

- Flies, midges
- Comprises 160,000 described species
- 0.2mm – 6cm (2in) – with a 10cm (4in) wingspan
- Sucking or piercing mouthparts
- Single pair of membranous wings
- Hind wings halteres (modified hind wings used for balance in flight)
- Larvae – maggots
- Leaf miners (e.g. *Liriomyza* spp.) very common



Thysanoptera

- Thrips, Thunder flies
- Comprises ~7,000 described species
- Many species are important pests of plants
- 0.5mm - 14mm (0.5in)
- Slender fringed wings
- Sucking mouthparts
- Vectors for viruses
- In temperate countries, they are mainly glasshouse pests
- Greenhouse thrips (*Heliothrips haemorrhoidalis*) has been increasingly common outdoors in the UK



Other groups

- Locusts (Orthoptera)
- Termites (Isoptera)
- Spider mites (Trombidiformes)
- Millipedes (Diplopoda)
- Flatworms (Platyhelminthes), not plant pests but harmful to biodiversity, common in some nurseries
- Slugs and snails



Long-tailed mealybug – *Pseudococcus longispinus*

- Caudal (tail) filaments are as long as or longer than body
- Eggs hatch almost immediately as they are laid or are kept inside the female until they hatch
- Very wide host range
- Multiple overlapping generations
- Protected by layer of wax
- Cosmopolitan, restricted to indoor plantings in cooler climates – relevant to most UKOTs
- Feeds on aerial plant parts but also roots
- Often ant attended
- Major glasshouse/shade house pest worldwide (on endemic plants in St Helena)



Ants

- Mutualistic relationship with bugs that egest honeydew
- Higher pest populations – protect, clean and disperse pests
- Interferes with biological control
- Fire ants (*Solenopsis* spp. and *Allomerus* (= *Wasmannia*) *auropunctata*) can sting
- Ant control is important for plant pest management



Biosecurity and pathways of introduction

- Prevention is better than cure
- Biosecurity is essential – consider sourcing plants, quarantine, management, monitoring pests
- Examine potential pathways of introduction and ways to mitigate the risk
- Pathways: plants including potting medium; people; vehicles , machinery, equipment; wood, bark, packaging; plant products; natural conditions (hurricanes, water)
- Whole ecosystems can be moved with large plants
- NPPO (local government) can provide support



Black bean bug - *Brachyplatys subaeneus*

- First detected in Montserrat in 2022, populations rapidly increased so by 2025 thousands of bugs were present, especially on pigeon pea.
- **Distribution** – Native to Asia. First detected in Panama in 2007, Florida in 2020, spreading rapidly.
- **Host plants** – Fabaceae. A wide host range is reported but not all these plants may sustain a population.
- **Impact** – minor pest of plants in Fabaceae. Likely to attract attention from farmers, gardeners and the public due to its nature of aggregating in very large numbers



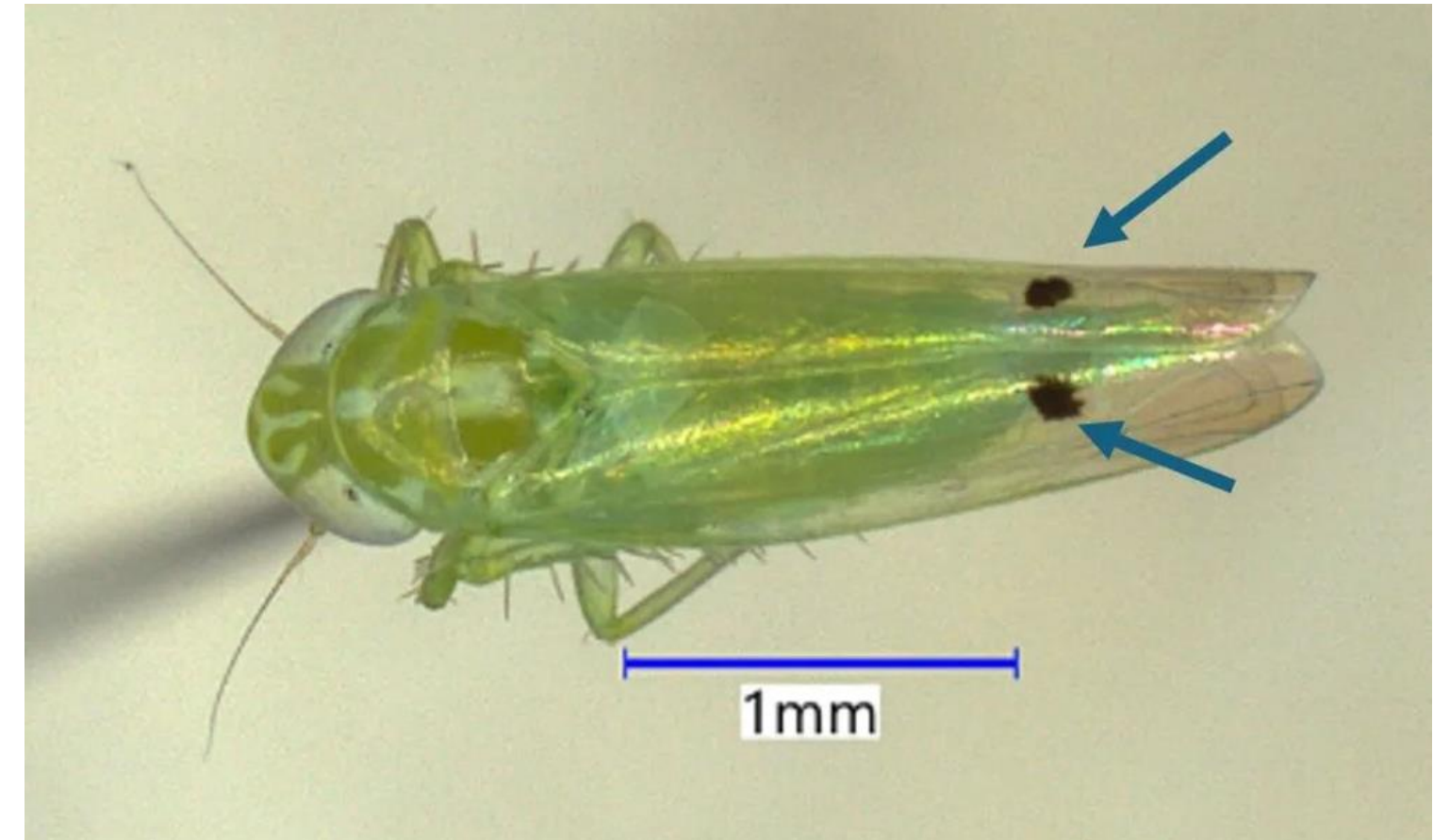
White Coconut Scale - *Pseudoparlatoria bennetti*

- First detected in Anguilla in 2025 – only present at 3 locations on coconut.
- **Distribution** - Native to the Neotropical region. Recorded from Colombia, Honduras, Trinidad and Tobago, and Venezuela.
- **Host plants** – Arecaceae (palms, especially coconut)
- **Impact** – economic pest of commercial coconut and oil palm orchards. Cosmetic damage to coconuts which are very important plants in the Caribbean. No evidence that they damage native palms.



Two-spotted leafhopper – *Amrasca biguttula*

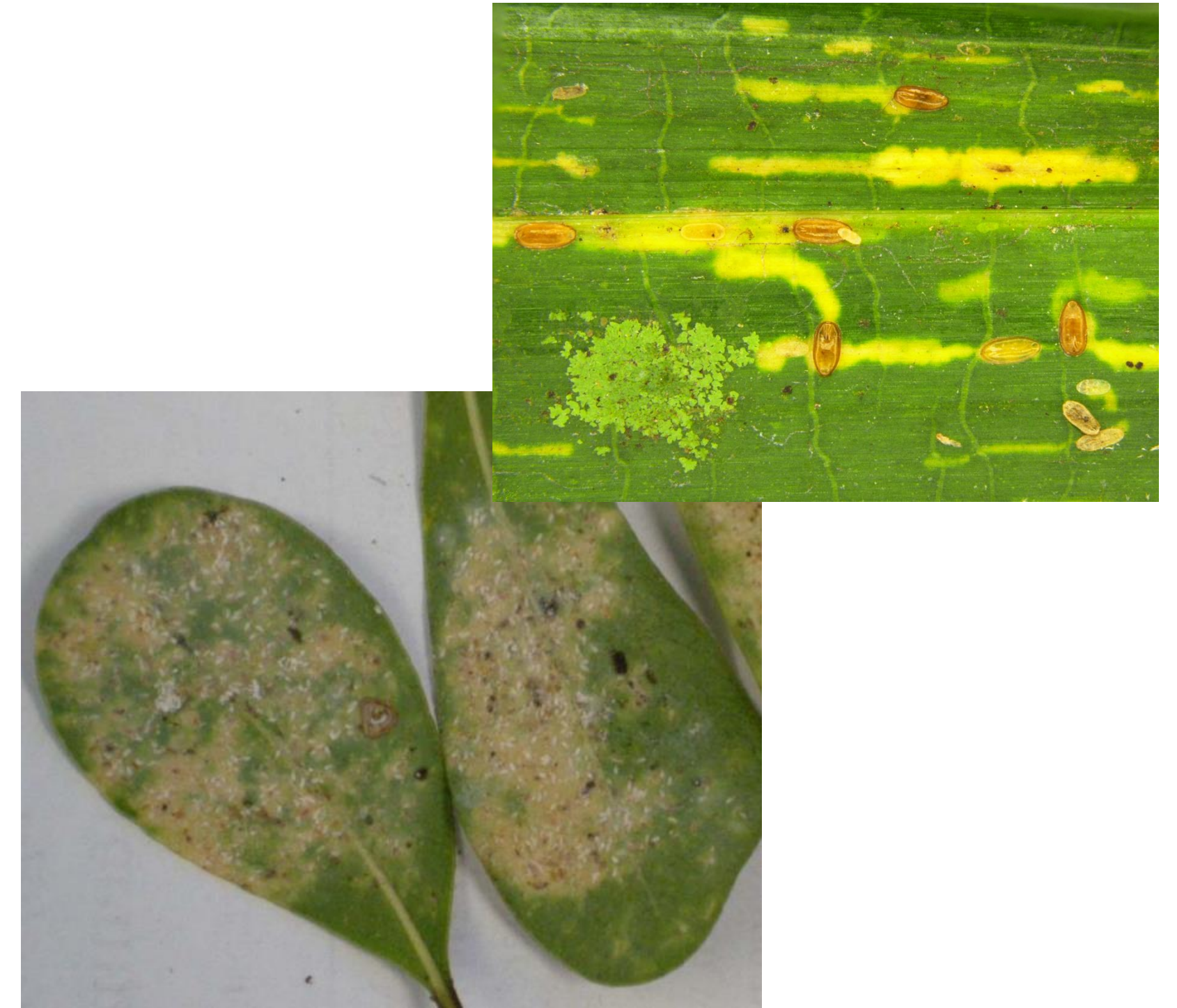
- An Asian leafhopper spreading rapidly in the Caribbean.
Caused severe damage to eggplant in Anguilla.
- **Distribution** - Native to Asia, now invasive in Africa and the Americas. First detected in Puerto Rico in 2023 and Florida in 2024; spreading rapidly across Caribbean and southern USA..
- **Host plants** – Polyphagous but it may not complete its life cycle on many of the recorded hosts. Most common on eggplant in Caribbean.
- **Impact** – important pest of eggplant/aubergine
- **Appearance** – adults are very small (2-3mm), pale green to yellowish green with a prominent black spot on each forewing



Adult two spot cotton leafhopper © Isaac L. Esquivel, University of Florida

Phantasma scale – *Fiorinia phantasma*

- A pest impacting many ornamental plant species but is especially prevalent on palms.
- **Distribution** - Native to Asia, now invasive in Florida (since 2008) and the Caribbean.
- **Host plants** – Polyphagous, recorded on plants in 20 families and host range expanding. Most common on palms.
- **Impact** – yellow patches on foliage, leaf drop, loss of plant vigour and stunting.
- **Appearance** – adults are very small (2-3mm), pale green to yellowish green with a prominent black spot on each forewing



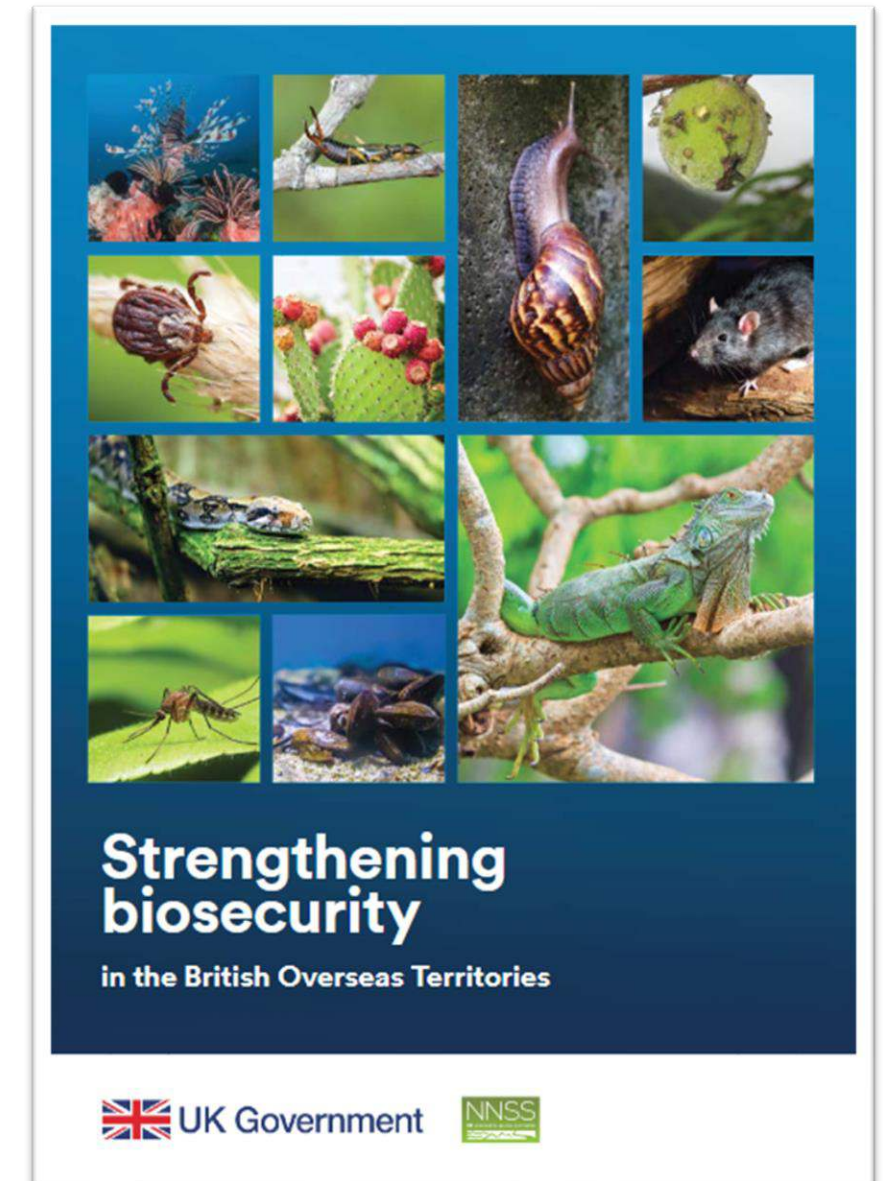
Infestation on underside of Pittosporum tobira leaf
© <https://dab.hawaii.gov>

Information Source – GB Non-Native Species Secretariat

- <https://www.nonnativespecies.org/overseas-territories>

Resources for OTs

- [Biosecurity toolkits](#)
- [Pest Risk Assessment resources](#)
- [Communications and education materials](#)
- [Horizon scanning results](#)
- [Prioritising containment and eradication action](#)
- [UK Overseas Territories database of Alien Species](#) developed through a UK Centre for Ecology & Hydrology project: [Enhancing monitoring and prevention of invasive non-native species across UKOTs](#) | [UK Centre for Ecology & Hydrology](#)



Information Sources – GB Non-Native Species Secretariat

- Factsheets on invertebrates, vertebrates and plants



Male House Sparrow © Even Lipton



Female House Sparrow © Douglas Seidler

House Sparrow

Taxonomy
Order: *Passeriformes*
Family: *Passeridae*
Species: *Passer domesticus* (Linnaeus)
Synonyms: *Fringilla domestica* Linnaeus

Summary
A small bird of Eurasian and African origin, the house sparrow is widely regarded as one of the most successful of all introduced species. It is present on every continent except Antarctica. An anthropophilic species, it achieves highest numbers in environments modified by humans, including agricultural, residential areas and cities. They are known to threaten local bird diversity, out-competing them for resources and can be a real pest on farmland by feeding and damaging ripening grains. To a lesser extent they may damage soft fruits and a variety of other commercially grown produce proving problematic particularly for small scale growers.

Biology
Passer domesticus is a monogamous, flocking, non-migratory species that tends to make its nests in holes in buildings, creeping/climbing plants against walls and trees, thick hedges/shrub or conifers. It is highly adaptable and makes its nests from a variety of materials including dry grass, paper, paper bark, feathers, hair, string, paper, seed heads, straw etc. Generally, most adults feed on insects when they're tending their young. They then feed on grains throughout the rest of the year be it from weeds, grasses or cultivated origin. House sparrows are recognised as having a prolonged breeding season with multiple broods.

Distribution in Caribbean
Common throughout the Caribbean region including Anguilla and TCI in disturbed and natural habitats.

Pathway of Entry
Natural dispersal: do not usually fly more than a few kilometres during their lifetimes. Limited migration occurs in all regions.
Intentional dispersal: human-mediated dispersal from one area to another by way of vehicles possible. House sparrows are known to forage on in trucks and other freight.

UK Overseas Territories Factsheet – Produced for Anguilla and the Turks and Caicos Islands

March 2016



Tamarix canariensis © Kreysser/Ziarnik

Canary Island Tamarisk

Taxonomy
Order: *Caryophyllales*
Family: *Tamaricaceae*
Species: *Tamarix canariensis* Willd.

Summary
A semi-deciduous, loosely branched shrub or small tree, endemic to the Canary Islands. It has been introduced to the Americas where it has naturalized, especially in deserts and semi-arid areas with high soil salinity, and become a highly invasive environmental weed, forming dense monocultures, altering habitats and threatening native biodiversity.

Biology
Tamarix canariensis has an extremely high reproduction rate, the ability to produce seeds over a very long period, efficient means of seed dispersal, the ability to reproduce vegetatively as well as by seed, and mechanisms for rapid seed germination and seedling establishment, allowing it to outcompete native plants. It grows in a variety of soil types (including sand, loam and clay) and can tolerate some salinity. It requires moist soils for 2-4 weeks after germination and produces a long tap root to access groundwater. It needs full sun and grows well in open areas.

Distribution in Caribbean
It is widespread in the Caribbean and has been found in parts of the Turks and Caicos Islands.

Further Information:
https://en.wikipedia.org/wiki/Tamarix_canariensis
<https://www.cebi.org/fac/datasheet/52486>
<http://www.iucnlist.org/glad/species.php?ac=72>
[this datasheet refers to *T. nana* but the information is pertinent to *T. canariensis*]

UK Overseas Territories Factsheet – Produced for Anguilla and the Turks and Caicos Islands

March 2016



Figure 1. Sri Lankan weevil, *Mylocerus undecimpustulatus undatus* adult © Gary R. McClellan

Sri Lankan weevil
MYLOCERUS UNDECIMPUSTULATUS UNDATUS

Background
The Sri Lankan weevil *Mylocerus undecimpustulatus undatus* Marshall (Coleoptera: Curculionidae), is a polyphagous plant pest native to Sri Lanka. It is also sometimes known as "Yellow-headed Ravenous Weevil" or "Asian grey weevil". It has spread into India and Pakistan where various subspecies of *M. undecimpustulatus* are reported to be among the most serious of all weevil pests in the region, attacking 20 different types of crop including cotton, vegetables, palms, and ornamentals. In the Americas, it was first detected in 2000 (possibly 1995) on *Citrus* sp. in Florida, USA, and spread rapidly through the county (Thomas, 2005). It was first detected in the Caribbean in one of the UK Overseas Territories (UKOT) in 2016. It is not known how it was introduced to the territory but it may have been transported with turf grass and ornamentals imported from south Florida for landscaping. Sri Lankan weevil poses an economic and environmental plant health risk to all the UKOTs in the Caribbean.

Geographical Distribution
Sri Lankan weevil is native to Sri Lanka and has spread through the Indian subcontinent and been introduced to North America and the Caribbean.
Asia: India, Pakistan; Sri Lanka.

UKOT PLANT PEST FACT SHEET

1



Figure 1. Giant African land snails *Lissachatina fulica* coming out at dusk to feed, Mauritius © Chris Malumphy

Croton scale
PHALACROCOCCUS HOWERTONI

Adult females and first instars of croton scale *Phalacrocooccus howertoni* infesting cotton *Gossypium variegatum* in Nassau, New Providence, Bahamas © Chris Malumphy

Background
Hemiptera: Coccidae, first recorded in Florida (USA) in 2008 and subsequently serious pest, was described by Hodges and Hodgson (2010) under the name *us howertoni* Hodges & Hodgson. It is commonly known as the croton scale and widely in the Caribbean region.

In the UK Overseas Territories it was first detected in the Cayman Islands in 2012 where it was found on a range of plants, including fruit trees (guava *Psidium guajava*, *Persea indica*, avocado *Persea americana*, soursop *Annona muricata*, breadfruit *Artocarpus altilis*, June plum *Spondias dulcis*, and Cayman red plum *Spondias purpurea*), and plants (croton *Codiaeum variegatum*, copperleaf *Acalypha wilkesiana*, Florida *Ficus aurea*, and West Indian jasmine *Isora* spp.) and native plants (red birch *Betula rubra*). Croton scale poses an economic and environmental plant health risk to all the UKOTs with tropical climates, especially those in the Caribbean where it is currently expanding its geographical range.

UKOT PLANT PEST FACT SHEET

1



Figure 1. Giant African land snails *Lissachatina fulica* coming out at dusk to feed, Mauritius © Chris Malumphy

Giant African Land Snail
LISSACHATINA FULICA

Background
Giant African Land Snail *Lissachatina fulica* (Bowditch) (Gastropoda: Stylommatophora: Achatinidae) is a major plant pest, native to East Africa, that has been introduced accidentally to many parts of the world with trade and/or intentionally as a commercial food source, for scientific research and education, and as a novelty pet. It has the ability to go into a state of aestivation in cooler conditions and so is readily transportable over considerable distances. It has established in many tropical regions where it has had a major negative impact economically, environmentally and socially due to its broad polyphagy and prodigious reproductive capacity. As a result, *L. fulica* has been classified as one of the world's top 100 invasive species by The World Conservation Union, IUCN (SSG, 2003). The snail can be found in agricultural areas, coastal areas, natural forest, planted forests, riparian zones, shrublands, and wetlands.

Lissachatina fulica presents a potentially serious plant health threat to all the UK Overseas Territories with tropical climates, particularly to those located in the Caribbean where the snail is currently expanding its geographical range.

UKOT PLANT PEST FACT SHEET

1

Fera

Information Sources – FDCAS – Caribbean

- Florida Department of Agriculture and Consumer Services
- <https://www.fdacs.gov/Agriculture-Industry/Pests-and-Diseases/Plant-Pests-and-Diseases/Pest-Alerts>



**Florida Department of
Agriculture and Consumer Services**

Commissioner Wilton Simpson

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Plant Industry Pest Alerts

Recent Pest Information

- [Pseudaonidia curculiginis](#) [[📄](#) 7 MB]
- [Ordonaspis serrata](#) [[📄](#) 4.3 MB]
- [Tropilaelaps](#) [[📄](#) 3.4 MB]
- [Pauroaspis scirrosis](#) [[📄](#) 1 MB]
- [Conehead Termite, Nasutitermes corniger \(Motschulsky\)](#) [[📄](#) 17.5 MB]
- [Helicococcus summevillei](#) [[📄](#) 3.9 MB]
- [Bambusaspis coronata](#) [[📄](#) 1.3 MB]
- [Pseudaulacaspis rubra \(Maskell\)](#) [[📄](#) 6 MB]
- [Citrus Fruit Borer, Gymnandrosoma aurantianum](#) [[📄](#) 3.3 MB]
- [Two-Spot Cotton Leafhopper, Amrasca biguttula](#) [[📄](#) 6.4 MB]
- [Bamboo Pit Scale, Bambusaspis minuta](#) [[📄](#) 4.8 MB]
- [Pongamia Mite, Aceria pongamiae](#) [[📄](#) 2.9 MB]
- [Vespa velutina, Yellow-Legged Hornet](#) [[📄](#) 1.2 MB]
- [Pseudaulacaspis colosuuae](#) [[📄](#) 762.2 kB]
- [Lime Swallowtail, Papilio demoleus](#) [[📄](#) 900.4 kB]
- [Sweetgum Inscriber](#) [[📄](#) 759.9 kB]
- [Sinomegoura citricola](#) [[📄](#) 927.6 kB]
- [Crappemyrtle Bark Scale](#) [[📄](#) 2 MB]
- [Japanese Honeysuckle](#) [[📄](#) 403.5 kB]

Plant Pests and Diseases

- [Biological Control](#)
- [CAPS](#)
- [Citrus Health Response Program](#)
- [Conehead Termite Eradication Program](#)
- [Eastern Lubber Grasshopper](#)
- [Florida Fruit Fly Exclusion and Detection Cooperative Program](#)
- [Florida Plant Viruses and Their Inclusions](#)
- [How to Submit a Sample for Identification](#)
- [Invasive Mollusks](#)
- [Laurel Wilt Disease](#)
- [Lime Swallowtail Citrus Pest](#)
- [Lycchee Erinos Mite](#)
- [Noxious Weeds](#)
- [Pasture Mealybug](#)
- Pest Alerts**

Red Palm Mite

PEST ALERT

FDACS-P-01665
Pest Alert updated October 2022.

Florida Department of Agriculture and Consumer Services
Division of Plant Industry

***Papilio demoleus*, Lime Swallowtail, on Key West, Florida**

James E. Hayden, Ph.D., Bureau of Entomology, Nematology and Plant
Kevin M. Burnette, Cooperative Agricultural Pest Survey,
Matthew R. Moore, M.S., Bureau of Entomology, Nematology and Plant
DPIHelp@FDACS.gov or 1-888-397-1517

INTRODUCTION
On September 23, 2022, photographs were posted online of larvae of the on Key West. Division of Plant Industry (DPI) personnel visited the proper examination and DNA sequencing confirmed to be *P. demoleus malayanus* (Eastwood et al. 2006). This butterfly is a well-known pest of citrus foliage Greater Antilles since 2004, and its invasion of Florida has been anticipated residential properties on Key West with immature stages on dooryard cit

DESCRIPTION AND FIELD SCREENING
Eggs are 1.0–1.5 mm, white to yellow, spherical and smooth. They are laid in clusters of 3–4 mm long and green with black and yellow bands across the thorax and brown, but pink or green forms occur. Adult butterflies (Fig. 5) have a black spot. Unlike most swallowtail butterflies, they do not have “tails” on the hindwings. The adult butterfly and the final-instar larva: a large, green papilionid eggs, pupae and younger dropping-mimic larvae resemble those of native *P. demoleus* for determination.

BIOLOGY AND HOSTS
Hosts are almost exclusively Rutaceae. Larvae prefer *Citrus* species and *Azadirachta indica*, *Aegle*, *Chloroxylon*, *Clausena*, *Flindersia*, *Fortunella*, *Glycosmis*, *Toddalia*, *Triphasia* and *Zanthoxylum* (Robinson et al. 2001). In Cuba, it has been reported by the general public in California and Louisiana, but their biology is not well known (Hernández and Minno 2015; M. Minno, pers. comm.). A female may lay more than 100 eggs under optimal conditions. Caterpillars they prefer young growth (Fig. 2).

DISTRIBUTION
Papilio demoleus is native from the Middle East to southern China, with the range has expanded into Indonesia and the Philippines. It occurs in Cuba, Hispaniola, Puerto Rico, the Virgin Islands, Jamaica and it has been reported by the general public in California and Louisiana, but their biology is not well known (Hernández and Minno 2015; M. Minno, pers. comm.). A female may lay more than 100 eggs under optimal conditions. Caterpillars they prefer young growth (Fig. 2).

POTENTIAL ECONOMIC IMPACT
Papilio demoleus is a key pest of citrus in Asia (Mineo 1986). It can defoliate citrus groves may be greater than on established groves.

SURVEY
Specimens must be sent to DPI's Entomology section for positive identification and documentation. Larvae sit on leaves, hidden only by mimicry and camouflage. Live specimens should be photographed before collection. Eggs, larvae and pupae should be placed in 70–95 percent alcohol. If large larvae start to darken in alcohol, they may be put into white vinegar (5 percent acetic acid) to preserve color. Adults are caught with a net, immobilized by pinching the thorax and put into an envelope. Forms and instruction for sample submission can be found at www.FDACS.gov/DPIsamples.

REFERENCES
Eastwood, R., Boyce, S.L. and Farrell, B.D. (2006). The provenance of Old World Swallowtail Butterflies, *Papilio demoleus* (Lepidoptera: Papilionidae), recently discovered in the New World. *Annals of the Entomological Society of America* 99(1): 164–168.
Hernández, D.M.F. and Minno, M.C. (2015). The slowly expanding range of *Papilio demoleus* Linnaeus (Lepidoptera: Papilionidae) in Cuba. *Tropical Lepidoptera Research* 25(1): 8–14.
Lewis, D.S. (2008). Lime Swallowtail, *Papilio demoleus* Linnaeus (Insecta: Lepidoptera: Papilionidae). UF IFAS Featured Creatures. Hosted by: UF IFAS. Available at: https://entnemdept.ufl.edu/creatures/bfly/lime_swallowtail.htm (Accessed Oct. 27, 2022)
Mineo, P. (1986). On citrus trees Lepidoptera and particularly on those inhabiting the Mediterranean area. P. 127–134 in: Cavalloro, R. and Di Martino, E. (Eds.). *Integrated Pest Control in Citrus Groves*. A.A. Balkema, Rotterdam.
Robinson, G.S., Ackery, P.R., Kitching, J.J., Beccaloni, G.W. and Hernandez, L.M. (2001). *Hostplants of the moth and butterfly caterpillars of the Oriental Region*. The Natural History Museum, London; Southdene, Kuala Lumpur. 744 p.



Florida Department of Agriculture and Consumer Services

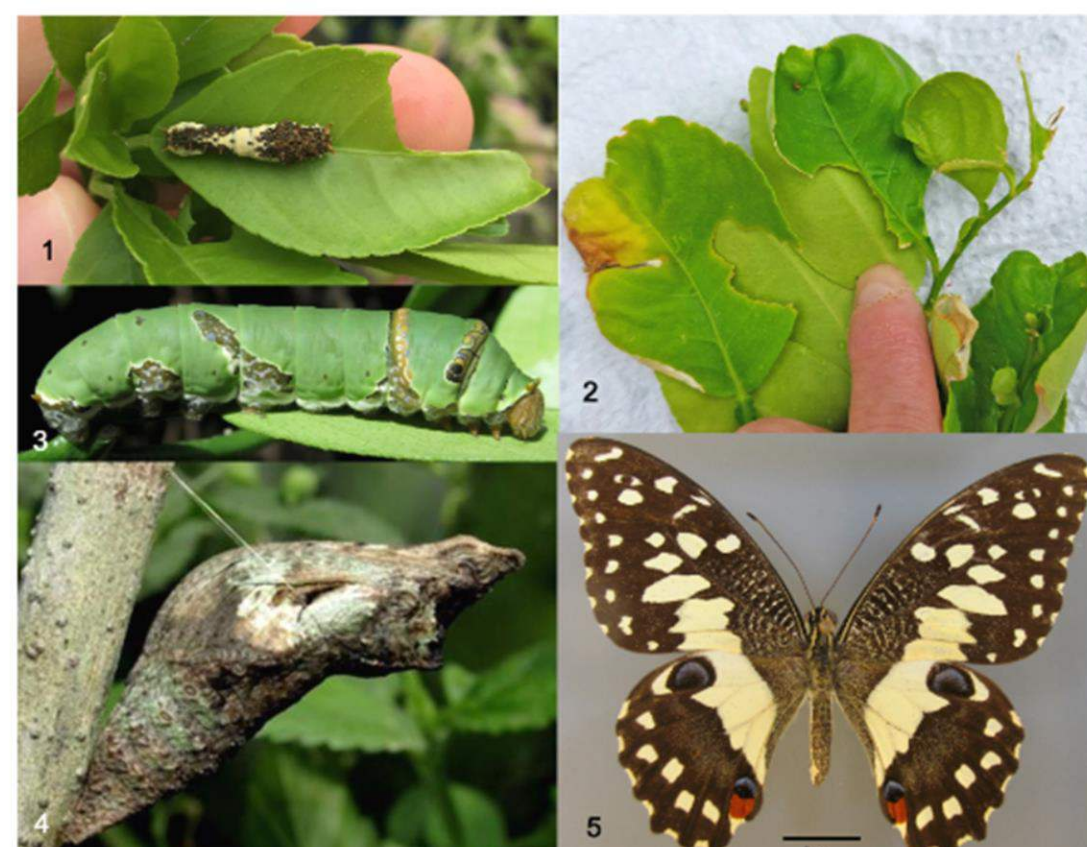
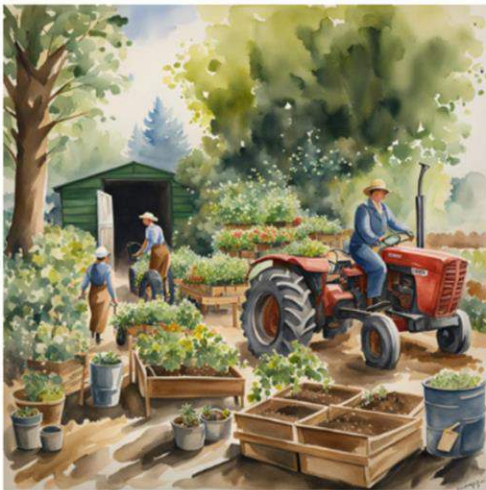


Fig. 1: 5th instar larva; Fig. 2: Leaf damage on citrus; Fig. 3: 5th (final) instar; Fig. 4: pupa (encircled); Fig. 5: adult butterfly. Images not to scale. Photos by K.M. Burnette, FDACS-DPI (Fig. 1); J.E. Hayden, FDACS-DPI (Figs. 2 and 5); D.M. Hernández Hernández, Camaguey, Cuba (Figs. 3 and 4).

Information Sources – Tree Health Centre

- <https://castlehowardarboretumtrust.org/treehealthresourcehub>

THC Resource Hub



The **Tree Health Centre Resource Hub** has been created to help make the wealth of tree health and biosecurity information across the internet more easily accessible. On these pages you will find links to reputable sources of information for a one stop shop for everything you need. New resources will be added as they become available.

If there is a resource you would like but can't find anywhere, let us know and we will see what we can do to fill the gap.

If you are an organisation with a resource that you would like to be included in the Resource Hub or you would like to work with us to create new resources, please contact Ginette here: treehealth@castlehowardarboretum.org.

Basic Biosecurity Guidance for Botanic Gardens and Arboreta

Botanic gardens and arboreta are wonderful resources and attract visitors from across the globe. Curation and conservation activities mean regular movement of plant material, often between countries, resulting in fantastic collections that are often rare, valuable and need protecting.

Biosecurity measures are proactive, precautionary steps aimed at disrupting pathways of pest and disease introduction and reducing the risk of outbreaks and their impacts. This poster and associated resource signposting aim to give botanic gardens and arboreta a helping hand to simplify implementing their own robust, site-specific biosecurity practices and ultimately protect all our plants and trees by making the world that little bit more biosecure.

Plants and people traveling around the world could bring hitchhikers with them, such as plant pest and diseases (P&D). When introduced to a new area, without their natural predators and control from their native region, they have the potential to cause substantial damage within collections and even spread, threatening susceptible plant species nationally.

People

All staff, volunteers and visitors add up to a lot of footfall across, in and out of the site. This footfall can potentially bring pest and disease hitchhikers along with them.

- Draw up a biosecurity policy outlining your organisation's resources and competence. Display it publicly and include it in staff and volunteer training and inductions.
- Make hygiene a priority e.g. foot washing with water, brushes, disinfectant, to remove dirt and plant material on arrival and leaving will reduce risk significantly.

Plants

Bringing plants on to site is the main way to move pests and diseases between premises. Therefore, integrating good biosecurity practice is essential to keep them out.

- Identify source plants from the UK where possible to reduce the risk of importing P&D with them.
- Ensure plants are from reputable sources of healthy stock, ideally with independently audited accreditation like Plant Healthy.
- Only accept deliveries of healthy stock with the necessary, complete paperwork e.g. Phytosanitary Certificate, Plant Passport.
- Keep new arrivals in a quarantine area for at least 2-4 weeks and monitor health regularly before introducing to the wider site.

Plant Products

Plant products include seeds, soil, compost, woodchip, vermiculite, Christmas trees etc, and can all harbour pests and diseases and introduce them to your site.

- Compost heaps and waste plant materials can be home to pests and pathogens and must be safely disposed of externally, incinerated or composted.
- Composting at temperatures for long enough periods to be effective is hard to achieve, so removal to a commercial composting facility is often the best option.

Wood, Bark & Wood Packaging Material

Wooden pallets arriving with deliveries can be as risky as the plants, pots or compost they carry, so it's important to take a holistic approach.

- It's not just plants. Think about the other things you have on site such as wooden pallets, tree stakes and cable drums.
- Do risk assessments for each one to identify potential issues. Check pallets have the ISPM 15 IPPC stamp to show they have been treated more than once and standing away from plants and plant products.

Vehicles, Machinery & Equipment (VME)

Vehicles, machinery and equipment often move off and on to site carrying pests and diseases with them.

- Consider the location and impact of visitor and staff car parks on biosecurity of your site.
- Maintain surfaces and clean leaves and debris away that can harbour pests and diseases.

Natural Conditions

Although we can't control the weather, there are things you can do to mitigate against the impact.

- Strong winds, rain, natural watercourses, floods and animals can all help pests and diseases travel long distances in short spaces of time.
- Maintain good general hygiene across site, avoid storage of timber and arrange near water and install windbreaks to reduce wind speed and impact.
- Water stored in tanks can harbour pathogens that transfer to stock when watering. Covering tanks, chemical treatments, UV filters and regular testing will reduce risk and give an early alert.
- Surface water in puddles or flood water can also harbour pathogens. Regular maintenance to prevent puddles and good hygiene practices such as removing soil, stones and other debris should also help minimise risks.
- Plants under stress are more likely to harbour pests and diseases. Keep them healthy with good planting and management practices.
- Rising temperatures and more extreme weather conditions due to climate change will mean plants may no longer be suited to their growing conditions. Think carefully about choosing the right plant for the right place to match changing conditions for the long term.

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Summary

- Every OT is unique and will have different pest priorities, but some pests are common to all territories
- Trade pathways and climate change together will lead to an increase in the abundance and diversity of plant pest species
- Prevention is better than cure
- Biosecurity is essential – sourcing plants, quarantine, management, monitoring pests
- Examine potential pathways of introduction and ways to mitigate the risk
- Healthy plants will be more resilient
- Fera offers a diagnostic service for plant pests and pathogens



Help is available

- There are so many pests and so much to learn it can seem overwhelming
- There are many sources of help available in person and online
- Local government
- Fera provides a free identification service
- Send enquires or photos to ukot@fera.co.uk





Original thinking... applied

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