Flower Industry Australia's comments on the draft group pest risk analysis for soft and hard scale insects on fresh fruit, vegetable, cut-flower and foliage imports

About FIA

Flower Industry Australia (FIA) is the national representative body for Australian flower growers and florists. FIA represents and advocates for its grower and retailer members at both national and state level on issues affecting the industry. The association is governed by a board of appointed directors who are either flower growers, retail florists and/or in possession of skills deemed beneficial to the Association. Members pay an annual membership fee, based on how they conduct their business (grower versus retailer), with corresponding voting rights.

FIA recognises the important role that the Department of Agriculture, Water & Environment (DAWE) plays in coordinating and delivering national biosecurity policy, and we welcome the opportunity to make a submission to DAWE with regards to the draft Pest Risk Analysis for soft and hard scale insects on fresh fruit, vegetable, cut flower and foliage imports (the PRA).

Millions of cut flowers arrive into Australia from across the globe, carrying a range of insects that are considered quarantine pests, as well as other potential new pests to Australia. In addition, these pests may also carry pathogens and parasites that could harm Australia's native plants or animals (Monash University and Invasive Species Council, 2019). The flower import sector is one of Australia's highest risk pathways. The Australian flower industry therefore needs absolute confidence that the biosecurity system enforced by DAWE is science-based, independent and transparent. Whilst FIA supports trade between countries, this trade must not be to the detriment of our own horticultural industries and the environment due to unwanted entry of pests, pathogens and parasites. FIA has reviewed the draft PRA for soft and hard scale insects, and the document raises some concerns which are now discussed.

1. The broad host range of scale insects warrants their risk to be upgraded from low to moderate

As stated in the PRA, previous assessments on individual species indicated that the Unrestricted Risk Estimate (URE) for some species of soft scales and the majority of hard scales was 'Very Low' or 'Negligible', which achieved the Acceptable Level of Protection (ALOP) for Australia. A review of previous assessments then concluded that previous ratings of 'Low' for the likelihood of distribution and 'Moderate' for the likelihood of spread for both soft and hard scales should be revised to Moderate and High, respectively. According to the pest matrix, the indicative URE for all soft and hard scale quarantine pests is thus now 'Low'. Having revised the likelihood of the distribution and spread of scale insects upwards to moderate and high, FIA would like to see the URE changed to moderate, as FIA believe that the consequence of their entry, establishment and spread is moderate, rather than low. As noted in the PRA, a single scale insect species can be highly polyphagous and is able to attack hundreds of species of host plants. They are incredibly cryptic, being often located in crevices and protected spaces, which makes them difficult to detect during harvest and inspections. The PRA states that scale insects on plant commodities would have the ability to tolerate cold storage used before and after air transportation and refrigerated conditions used in sea transportation. Indeed, as stated in the PRA, live scale insect pests have been intercepted in international trade by Australia.

As stated within the PRA, introduced scale insect pests often cause more serious damage to host plants in newly colonised regions than in regions of origin, perhaps because their natural enemies are not present, and can go on to become serious pests, both environmentally and economically. The broad host range of scale insects puts many of Australia's important agricultural and horticultural industries (such as fruit, vegetables, cut-flowers and foliage) at risk. It also puts our endemic flora at risk too. For example, Australia has a very diverse cycad flora, but as they consist of small populations, they are highly vulnerable to extinction (Monash University and Invasive Species Council, 2019). Six Australian cycads are listed as nationally endangered, eight are listed as vulnerable, and others are listed as threatened. Australia allows the importation of cycad foliage for the florist trade from all countries, which could potentially be carrying cycad aulacaspis scale. This scale can reduce seed output and seedling vigour, meaning that it could cause extinctions even without killing plants. It is already known to attack an Australian species (Cycas media) in cultivation overseas. The scale has wide climatic tolerances, and much of Australia (including regions such as eastern Queensland, which is rich in cycad species) is considered suitable (Monash University and Invasive Species Council, 2019).

2. Scale insects associated with the trade of cut flowers and foliage are often found on flowers with a history of import quarantine failures, making their risk of entry even higher

According to the PRA, 6% of soft scales were intercepted on cut-flowers and 11% on foliage. For hard scales, 1% were intercepted on cut–flowers and 5% on foliage. Data within the PRA shows that the main economically important host plants for scale insects with respect to cut flowers and foliage imports in Australia are chrysanthemums and roses. The PRA documents 13 species in 4 genera of soft scales and 4 species in 5 genera of hard scales associated with Chrysanthemum spp., and 32 species in 11 genera of soft scales and 53 in 27 genera of hard scales associated with Rosa species. They are also known to be associated with a range of other flowers such as orchids and lilies, and foliages such as palm and cycad fronds, ferns and ruscus.

It is concerning that the two flower imports with which scale insects are most commonly associated are high offenders in terms of quarantine mismanagement, and FIA believes that this makes them at greater risk of entry. For example, in July 2020 DAWE suspended the systems approach and alternative NPPO-approved disinfestation treatment measures for chrysanthemum cut flowers from Malaysia due to repeated detections of *Liriomyza huidobrensis* (Serpentine leaf miner). In October of the same year, *L. huidobrensis* was detected in Western Sydney, NSW and has subsequently been deemed as ineradicable. FIA believes it is highly likely that the leaf miner incursion was a direct result of chrysanthemum imports. Imported roses are predominantly arriving into the country from Kenya, Ecuador and Colombia – all countries with high volumes of trade and a long history of very high non-compliance due to questionable phytosanitary practices.

3. The grouping of hard and soft scales together in the PRA is inappropriate

Scale insects are an incredibly diverse group, with the three most common families being the soft scales, the hard scales, and the mealybugs. Mealybugs were assessed and reported on previously by DAWR in a separate PRA. Although the current draft PRA considers it appropriate to assess soft and hard scale insects together, the FIA disagrees, and considers that there are enough marked differences between them to affect their biosecurity risk.

For example, hard scales are tiny (1 to 3 mm). The body is protected by a hard waxy cover secreted by the insect and also consisting of the exuviae of previous growth stages, which protects the eggs laid by the female. The waxy covers vary in size and shape, and male and female covers can differ in

size and shape for the same species. Most hard scale insects reproduce sexually, and can overwinter as eggs, nymphs, or adult females. Some hard scales have four generations per year. They feed on cells of the mesophyll and do not produce honeydew. In contrast, soft scales are fairly large (2 to 6 mm long). Soft scales do not secrete a waxy covering that is separate from the body. If wax is present, it is thin and glassy and adheres tightly to the body of the female. They may reproduce sexually or asexually. Females either lay eggs or give live birth, depending on the species. Alarmingly, different host plants can alter the body form of a single species of soft scale so much that taxonomists have described the different forms as separate species (Baker et al., 1994). They feed on phloem of the host plants and produce honeydew. As stated in an earlier publication by DAWR, the production of honeydew is closely related to their impact on plants, both from the perspective of development of other issues (e.g. sooty mould), and interaction with ants. The presence of ants can increase the impact and damage of scale insects on plants (DAWR, 2019). The current PRA states that most soft *and* hard scale insects reproduce sexually, and 'some' asexually. The FIA would argue that it is more accurate to say that most hard scales produce sexually, but soft scales can produce *either* sexually or asexually. Given that every female of soft scale is capable of producing offspring without fertilization (see Baker et al., 1994), soft scale populations of significant size can develop during a single growing season. As stated in the PRA, cut-flowers and foliage infested with soft scale pests could be transported for retail sale to multiple destinations, and are likely to reach areas with susceptible host plants. As soft scales can tolerate cold, their transport and delivery would have no detrimental effect on their survival. At retail outlets such as flower markets or florists, flowers and foliage may be displayed at ambient temperature that would support the survival and development of soft scales. These significant biological differences between hard and soft scales and the ease with which soft scale populations could establish cannot be viewed lightly and for this reason FIA believes the two groups should be assessed separately.

4. Scale insects are not being identified adequately to elicit an appropriate response

As reported in the draft PRA, there have been 496 soft scale and 2691 hard scale interception events recorded on the plant import pathway by Australia in the last 18 years (2000–2018). On average, there were 27.6 interceptions of soft scales and 149.5 interceptions of hard scales per year for the last 18 years. For soft scales, almost three-quarters (74.9%) of intercepted insects were identified only to family level, and for hard scales this number was almost half (44.9%). FIA acknowledges that a similar percentage of hard scales have been identified to species level (48%), but given that the three most frequently intercepted hard scale species make up 35.4% of the total hard scale interceptions, this is not surprising. DAWE provides some reasons for the worrying lack of generic or species level identifications, including lack of adequate taxonomic expertise in Australia, the time-consuming process of preparing slide-mounted specimens for identification, intercepted specimens being damaged and/or immature, and importers opting for treatment of their goods without requesting specimen identification. These are concerns raised previously by Saverimuttu (2014), who noted that when cut flower commodities land in Australia and the boxes are inspected there is very little time available to adequately assess the level of pest or pathogen infestation and apply the appropriate corrective action, leading to a potentially inconclusive or questionable outcome. This is in part due to the perishable nature of the consignments but is also due to the lack of identification tools, taxonomic keys and PCR techniques, and a lack of taxonomic knowledge. Previous analysis of interceptions of other insects such as Coleoptera, Hemiptera, Lepidoptera and Diptera at the Australian border has indicated poor detection and/or identification as rendering the system largely ineffective as an early warning for a large proportion of incursions (Caley et al 2015). The system failures are thought to be due to organisms arriving via pathways that are not subject to border inspection, or as a result of low inspection sensitivity, or that the species discovered are not reliably identified, recorded and reported.

FIA finds all of this alarming. If specimen identification is not done, how do we know what is there? If the true frequency of introduction is unknown, the proportion of insect pests intercepted by border biosecurity cannot be determined accurately (Caley et al. 2015). How can DAWE oversee the biosecurity process adequately if specimen identification is lacking? Why is it seemingly in the hands of the importers to decide if this data is gathered or not? Perhaps the lack of taxonomic expertise could be rectified by importers paying a levy which goes towards science funding, to train people to get the skills to enable our taxonomic expertise to be 'adequate'?

5. Final comments

FIA again emphasises the comments we have already made in a previous PRA submission, being that although we acknowledge there have been some positive improvements made to our biosecurity systems over the past 20 years, it is alarming that, even with the advent of both offshore and onshore measures to manage pest incursions, cut flowers and foliage continue to be subject to a less rigorous screening process than imports of other plant materials, the sampling level remains low, inspection methods continue to be non-destructive (enabling pests to be easily overlooked), taxonomic expertise is frighteningly lacking, phytosanitary certificates remain untrustworthy (particularly from our African trading partners) and fumigation has proven to be ineffective (the serpentine leafminer incursion of 2020 being a pertinent example).

References

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