Australian Government
Department of Agriculture, Water and the Environment

RISK BACKGROUND

Daucus carota seeds for sowing

Overview

Daucus carota (carrot) seeds that are imported for sowing require an import permit and must be:

- labelled with the full botanical name
- packed in clean, new packaging
- compliant with Australia's seed purity requirements to minimise contaminant risks
- inspected on arrival
- treated or tested in accordance with Australian requirements.

Importers and department staff must ensure that all BICON conditions are met and that goods are free from biosecurity risks, as well as the key risks described below.

Figure 1. *Daucus carota* seed [1]

Key risks

Seeds of *Daucus carota* (carrot) can harbour seed-borne pathogens of biosecurity concern, as well as a range of biosecurity risk material.

'Candidatus Liberibacter solanacearum'

'Candidatus Liberibacter solanacearum' is not known to occur in Australia and is an economically important pest of apiaceous crops. In carrot, '*Ca.* L. solanacearum' causes a range of symptoms including leaf yellowing, leaf discolouration, as well as reduced main root and lateral root proliferation[2]. More information on this pathogen can be found at department's Final pest risk analysis for 'Candidatus Liberibacter solanacearum' associated with apiaceous crops.

Australia manages the biosecurity risks posed by '*Ca.* L. solanacearum' by requiring imported host seeds to be hot water treated or tested and found free of the bacteria prior to release from biosecurity control.

Other pathway risks

Imported seeds may harbour a range of other biosecurity risk material, including insects (e.g. Khapra beetle), disease symptoms, and contaminants such as soil, weed seeds, hitchhiker pests (e.g. Khapra beetle) and trash. These biosecurity risks are managed through standard seed import conditions, including on-arrival inspection of all consignments and purity testing as required under import conditions.

Document information

Version	Date	Details of amendment
1.0	30 March 2021	First publication of document.
2.0	31 March 2021	Updated to reflect suspension of fungicide treatment condition.

[1] Welbaum, A (2005), Vegetable Seed Production: Carrot, Department of Horticulture, Virginia Tech, accessed 24 February 2021

[2] Munyaneza, JE, Lemmetty, A, Nissinen, AI, Sengoda, VG & Fisher, TW 2011, 'Molecular detection of aster yellows phytoplasma and *Candidatus* Liberibacter solanacearum in carrots affected by the Psyllid *Trioza apicalis* (Hemiptera: Triozidae) in Finland', *Journal of Plant Pathology*, vol. 93, pp. 697-700.

[3] Bastide, F., Sérandat, I., Gombert, J., Laurent, E., Morel, E., Kolopp, J., Guillermin, P., Hamon, B., Simoneau, P., Berruyer, R. and Poupard, P., 2016. Characterization of fungal pathogens (Diaporthe angelicae and D. eres) responsible for umbel browning and stem necrosis on carrot in France. *Plant Pathology*, 66(2), pp.239-253.