

Potential hosts of branched broomrape (*Orobanche ramosa* L.) in Australia

John Virtue, Che DeDear, Anna Traeger, Frank Anderson and Brett Broomell
Animal and Plant Control Commission, GPO Box 1671, Adelaide, South Australia 5001, Australia

Summary Branched broomrape (*Orobanche ramosa* L.) is a parasitic weed that is the subject of an eradication program in the western Murray-Mallee region of South Australia (SA). Broomrapes are parasites of broadleaf plants, attaching to host roots to obtain nutrients and water, and eventually producing a non-photosynthetic, aboveground, flowering stem. Broomrape seeds respond to chemical triggers from host roots to both germinate and attach to these roots. Branched broomrape has a reputation amongst the broomrapes as a species with a wide host range of broadleaved plant families. However, there are differences in hosts affected between countries, which is perceived as being due to genetic differences between 'strains' of the species. Host-testing has been done for the branched broomrape strain present in SA, to identify what agricultural and horticultural crops are at risk if the weed spreads, and to identify management options such as germination-promoting green manure crops.

A hydroponic system was used to microscopically observe germination and attachment to host roots. Hosts were grown on glass-fibre paper in suspended plastic bags and branched broomrape seeds were applied to the root zone. Pot trials were also done where hosts were grown in soil or potting mix containing branched broomrape seed. Hosts were confirmed as such when parasitic attachments of branched broomrape were observed on host roots and/or flowering shoots of branched broomrape emerged from pots. After seven hydroponic or pot trials the following crop and s/pasture species have been confirmed as potential hosts:

- Brassicaceae: canola (*Brassica napus* L. var *napus*), cabbage (*B. oleracea* L. var. *capitata* L.), broccoli (*B. oleracea* L. var. *italica* Plenck) and white mustard (*Sinapis alba* L.).
- Solanaceae: tomato (*Lycopersicon esculentum* Mill.) and potato (*Solanum tuberosum* L.)
- Apiaceae: carrot (*Daucus carota* L. ssp. *sativus* (Hoffm.) Arcang.) and coriander (*Coriandrum sativum* L.)
- Fabaceae: vetch (*Vicia sativa* L.), faba bean (*Vicia faba* L.), lupin (*Lupinus albus* L.), chickpea (*Cicer arietinum* L.), seedling lucerne (*Medicago sativa* L. ssp. *sativa*), burr medic (*Medicago polymorpha* L.), disc medic (*M. tornata* (L.) Mill.), woolly burr medic (*M. minima* (L.) Bartal.), Shaftal clover (*Trifolium resupinatum* L.) and annual white clover (*T. michelianum* Savi).
- Asteraceae: lettuce (*Lactuca sativa* L.), safflower (*Carthamus tinctorius* L.) and sunflower (*Helianthus annuus* L.).

Various weeds and native herbs in the Brassicaceae and Asteraceae, plus Salvation Jane (*Echium plantagineum* L.) in the Boraginaceae have been observed as hosts in the quarantine area. There was variation between hosts in the frequency with which attachments were observed. This was probably due to host performance under different growth conditions, the solubility of a host's chemical triggers, and/or branched broomrape seed and host root densities. Key crops in the region which have not been observed as hosts in the trials to date are onion (*Allium cepa* L.) and field peas (*Pisum sativum* L.).

Keywords Branched broomrape, *Orobanche ramosa*, host, parasite.