Brassicaceae-based management strategies used to combat nematode pests in agricultural cropping systems: A review

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Abstract: A wide range of Brassicaceae crops are grown worldwide as an important source of oil, food and animal fodder. Moreover, these crops also have economical value due to their nutritional, medicinal, bioindustrial, biocontrol and crop rotation properties. Plant-parasitic nematodes, including root-knot (*Meloidogyne* spp.) nematodes, annually cause substantial crop yield and quality losses to agri- and horticultura crops worldwide. To minimize damage caused by these pests Brassicaceae species are included in cropping systems as cover-, rotation-, green manure/amendment- and/or biofumigation crops. Glucosinolates that are released by these crops as well as decomposition products of such crops contribute towards reducing population levels of nematode pests in soils. In terms of Nematology research being conducted thus far, the main focus has been on the use of various Brassicaceae strategies to manage economically important plant-parasitic nematodes such as *Meloidogyne*, *Pratylenchus*, *Heterodera* and *Globodera* spp. in global agri- and horticultural production systems. The use of Brassicaceae crops constitute a viable and promising strategy to combat nematode pests that were traditionally generally management by the use of toxic, synthetically-derived nematicides. A need thus exists to summarize the vast amount of information that has been generated about the efficacy of Brassicaceae spp. in particular that have been and are used to combat nematode pests. Therefore, a comprehensive review about nematode pests that are associated with Brassicaceae crops, the host status of various Brassicaceae spp. to particularly *Meloidogyne* spp. and other nematode pests as well as the effect of Brassicaceae-based management strategies in reducing nematode pest population levels in cropping systems are accentuated in this manuscript.

Key Words: Biofumigation, Brassicaceae, cover/green manure crop, plant-parasitic nematodes, root-knot nematodes, soil amendments