

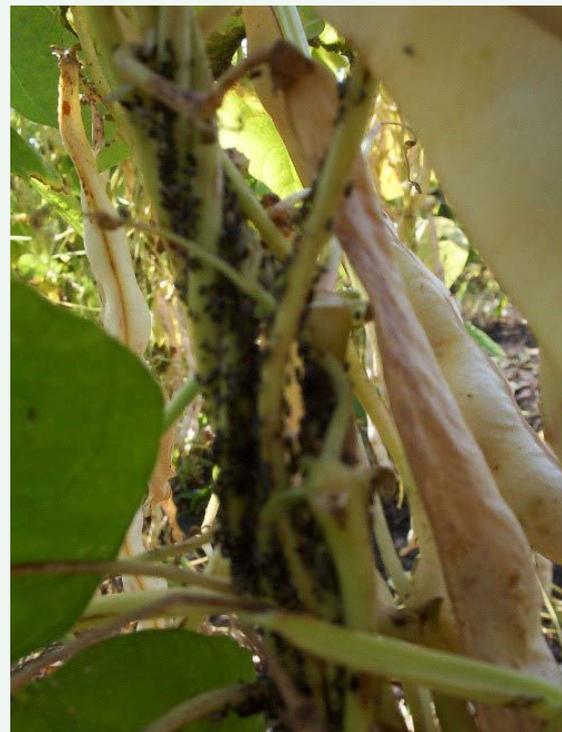
## PRACTICE ABSTRACT 6

### Black bean aphid control in organic bean

Black bean aphid - *Aphis fabae* Scop. is a polyphagous species, attacking over 200 plant species: ornamental shrubs, represent primary hosts (such as the spindle tree - *Euonymus europaea*, *Viburnum* shrubs, or the mock-orange *Phyladelphus coronarius*) and herbaceous plants (celery for seed production, spinach, beans, corn, poppy, sugar beet, are secondary hosts). This aphid may have originated in Europe and Asia, but it is now one of the most widely distributed species of aphid.



The black bean aphid is a small insect, 1.6–2.5 mm, black, with a soft-body. Alates are winged forms of aphid and appear in autumn when they lay eggs on woody plant species. The adults then die and the eggs over winter. During spring, wingless females known as stem mothers hatch from the eggs. They can reproduce by parthenogenesis and give birth to 3–4 generations. Many adults are devoid of wings and develop large colonies. When the branches of host species are lignified, winged forms appear and migrate to herbaceous plants - the secondary hosts, including bean. The Black bean aphid sucks sap from leaves and form colonies on shoots, flowers, pods and on the underside of leaves. Continuous feed affects the plant, leaves become wrinkled, discoloured and dry, and pods remain small giving low yields. For seed crops such as bean and beet the aphid is particularly dangerous because it is a vector for some plant viruses.



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#### Control

- Removal of host weed species to reduce effective population numbers.
- Attracting species natural enemies:
  - o parasites: *Aphelinus* sp., *Praon dorsale* Hal., *Lisiphlebus fabarum* Marsh., *L. ambiguus* Hal., *Trioxys angelicae* Hal.
  - o predators: *Coccinella septempunctata* L., *Hippodamia variegata* L., *Adalia bipunctata* L., *Syrphus* sp., *Leucopis griseola* T., *Chrysopa carnea* Steph. *C. pearla* L.
  - o by cultivation of Umbelliferae and Compositae plants as sources of food and refuge places on hot days for beneficial fauna.
- Application of treatments with repellent products: extracts fermented by *Artemisia absinthium*, *Urtica dioica*, dolomite dust, ash.
- Application of treatments by spraying or dusting with botanical insecticides: neem, piretrins, rotenon, Quassia extract. If the attack is small, the treatments can be localized only on the infested plants. If the attack is generalized, the treatments will be applied to the entire plant. Note that natural (botanical) insecticides are not selective for useful fauna and are not compatible with the use of pollinating insects (bees and bumblebees).
- Application of treatments by spraying or dusting with biological insecticides based on entomopathogenic agents: *Entomophthora aphidis* Hoffm., *E. fresnei* Now., *Cladosporium* sp.



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#### THE AUTHOR

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#### THE PROJECT

### BRESOV SHAPING THE FUTURE OF ORGANIC BREEDING & FARMING

BRESOV aims to tackle the nutritional challenges of a growing world population and changing climatic conditions by enhancing productivity of different vegetable crops in an organic and sustainable farming infrastructure. BRESOV works on broccoli, snap bean and tomato as those staple vegetable crops have significant roles in meeting our global food and nutritional security goal, and under organic conditions can contribute to storing carbon, introduce nitrogen and improve organic soil quality.

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