Field and landscape management to support beneficial arthropods for IPM on vegetable farms (VG16062)

Geoff Gurr

Charles Sturt University

Hort Innovation

Images: Frech, Fluch & Ivan Simionov

Boosting beneficials in your vegetable crop

Beneficials that were more abundant in the presence of flowering strips

Brown lacewings

The brown lacewing will feed on aphids, thrips, mites, caterpillars and moth eggs. Both the adult and larval stages are predatory.

Ladybird beetles

A number of ladybird beetle species are generalist predators and will attack a range of insect pests including aphids, leafhoppers, thrips, mites, moth eggs and small larvae. Both the adult and larval stages are predatory.

Carabid beetles

There are many types of carabid beetle species. They are ground dwelling, tending to remain in the same area and are generalist predators. Both the larval and adult stages of carabid beetles will feed on other invertebrates.

Parasitoid wasps

Certain wasp species can aid in pest control by parasitising specific life stages of pest species. The species *Diadegma semiclausum* specialises in laying its eggs in diamondback moth

Spiders

Spider species found in vegetable crops are generalist predators that will attack a variety of

Damsel bugs

Damsel bugs are generalist predators and will attack a variety of prey, including aphids, moth eggs and small moth larvae.

Parasitoids are small insects that develop either within or attached to the outside of other insects (hosts).

Unlike some parasites, like ticks or fleas, parasitoids eventually kill the host in which they develop. Many parasitoids found in vegetable fields are types of wasp.

Aphidius sp. laying an egg into an aphid nymph

A diamondback moth larva

A cabbage white butterfly larva

Larvae of the cabbage white butterfly and diamondback moth are key pests of brassica.

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Boosting beneficials in your vegetable crop

A tale of three scales:

1. Within field
2. Field adjacent
3. Landscape

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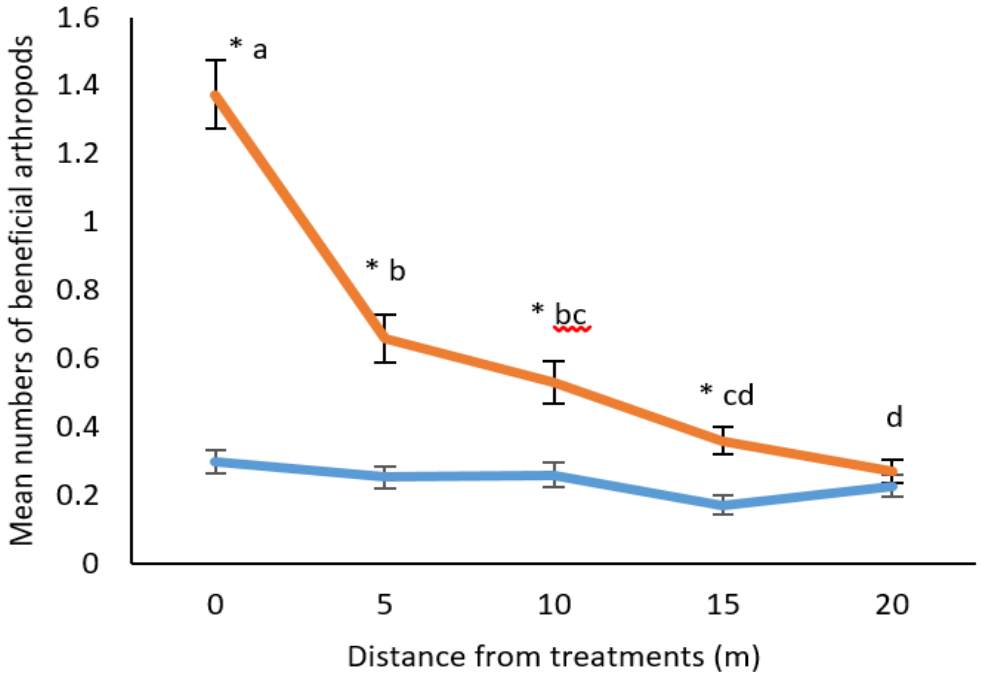
Boosting beneficials in your vegetable crop

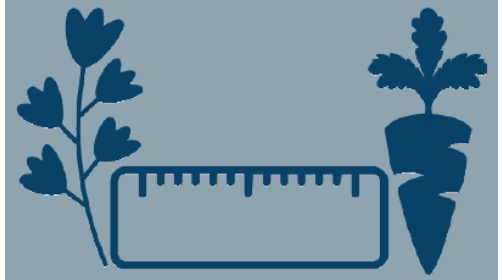
1. Within field

Nectar producing flowering strips that are planted next to a crop can improve beneficial activity in the paddock

Boosting beneficials in your vegetable crop

1. Within field





15m

into the crop beneficials were more abundant

X2

rate of diamondback moth parasitism

Flower strips reduced crop damage, leading to benefit: cost ratios as strong as

8:1

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Becoming familiar with planting strip options

It is important to consider the growing patterns of crops and 'companion plants' so that they overlap in time. The following information will aid in planning for planting of flowering strips and other companion plants.

Sweet alyssum
Lobularia maritima

Cornflower
Centaurea cyanus

Common buckwheat
Fagopyrum esculentum

Boosting beneficials in your vegetable crop

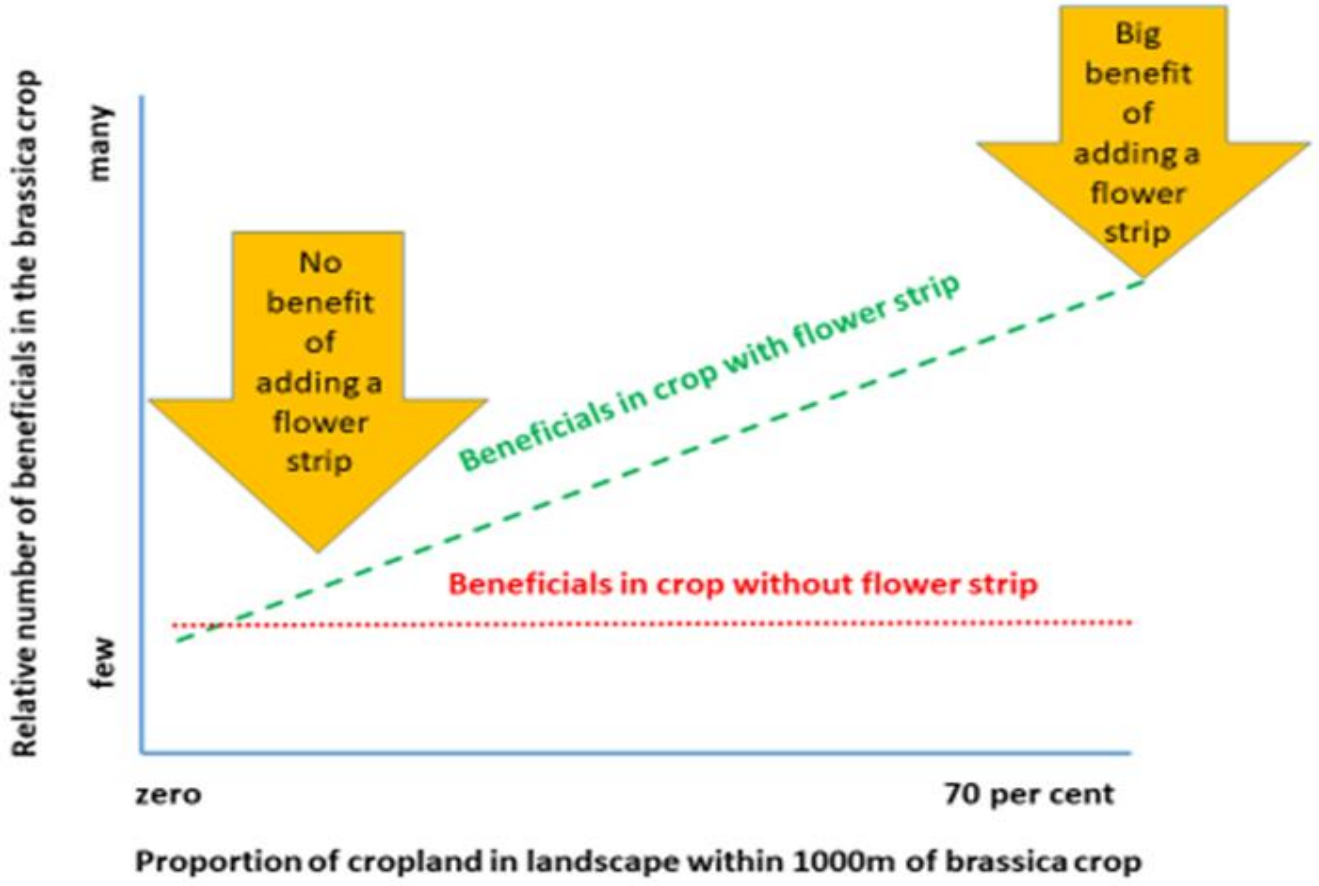
2. Field adjacent

Table 3. Brassica vegetable results showing desirable effects (more beneficials, fewer pests) in green and undesirable effects (fewer beneficials and more pests) in red. Intensity of shading shows how strong the effect is whilst the characters in each cell show the level of confidence in the result from statistical analysis (0= no effect, *= 95% confidence, ** = 99% confidence, *** = 99.9% confidence).

Pests	Weeds	Shelterbelt	Road	Riparian veg	Pasture	Dam	Brassicas
Cabbage aphid	0	***	0	*	0	***	**
Green peach aphids	0	0	***	0	0	0	0
Thrips	***	***	0	***	_***	***	***
Whitefly	***	***	**	0	***	0	0
Rutherglen bug	0	0	0	***	***	**	***
Diamondback moth	0	***	0	***	**	0	0
Cabbage white butterfly	0	0	0	**	0	0	*
Beneficials	**Weeds**	**Shelterbelt**	**Road**	**Riparian veg**	**Pasture**	**Dam**	**Brassicas**
Ladybeetle	0	***	0	0	***	0	***
Spider	*	*	***	0	0	0	0
Brown lacewing	*	***	***	**	***	0	0
Parasitic wasps	0	***	*	0	*	0	**
Aphid mummies	0	***	***	0	0	**	***

Boosting beneficials in your vegetable crop

Landscape scale



Boosting beneficials in your vegetable crop

Actions to improve in-crop beneficial activity

1. To improve beneficial activity in the crop, establish strips of flowering (nectar producing) plants approximately 30 metres apart.
2. To achieve maximum returns, plant flowering strips in areas such as sprinkler rows so that no crop area is sacrificed.
3. Plant flowering strips that are single-species or mixed-species depending on seed availability and cost.
4. Pair flowering strips with planting of trap-crop strips to improve control of pest species.

General actions to support beneficials in your landscape

1. Preserve uncultivated areas on farm, including woody vegetation and shelterbelts, as these can support beneficials and help suppress crop pests.
2. Exercise effective control of weeds, especially those that are related to your crop (e.g. brassica weeds close to brassica vegetables). This includes weeds within areas of woody vegetation.