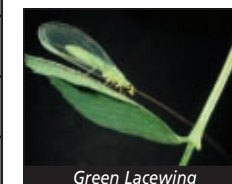


IMPACT OF INSECTICIDES ON NATURAL ENEMIES FOUND IN BRASSICA VEGETABLES

Information provided is based on the current best information available from research data.

Users of insecticides should check the label for registration in their particular Crop & State, and for rates, pest spectrum, safe handling and application details.

INSECTICIDES	TOXIC EFFECT ON SPECIFIC NATURAL ENEMIES*						RATING OF INSECTICIDE IMPACT ON NATURAL ENEMIES OVERALL*
	Parasitic wasps		Predators				
Active Ingredient	Egg Parasitoid <i>Trichogramma</i>	Laval and Pupal Parasitoids	Predatory Beetles	Predatory Bugs	Lacewings	Spiders	The Natural Enemies Assessed; Larval, Egg and Pupal Parasitoids Predatory Beetles Predatory Bugs Lacewings Spiders
Bacillus thuringiensis (Bt)	VL	VL	VL	VL	VL	VL	★ ★ ★ ★ ★ SOFTEST
pirimicarb (Pirimor®)	H	VL	VL	L	VL	VL	★ ★ ★ ★ ★
pymetrozine (Chess®)	L	L	L	L	L	L	★ ★ ★ ★
spinosad (Success®, Entrust®)	VH	M	VL	M	VL	VL	★ ★ ★ ★
emamectin benzoate (Proclaim®)	M	M	L	H	L	M	★ ★ ★ ↘
imidacloprid (Confidor®) soil	L	L	L	M	L	L	★ ★ ★ ↘
indoxacarb (Avatar®)	L	M	H	L	VL	VL	★ ★ ★ ↘
chlorfenapyr (Secure®)	VH	M	M	M	L	L	★ ★ ★
endosulfan	VH	M	M	M	L	M	★ ★ ★
fipronil (Regent®)	VH	H	L	M	VL	M	★ ★ ↘
imidacloprid (Confidor®) foliar	VH	M	H	H	L	L	★ ★ ↘
organophosphates	H	H	H	H	L	M	★ ★ ↘
methomyl (Lannate®, Marlin®, Nudrin®, Electra®)	H	H	VH	H	H	M	★ ★
synthetic pyrethroids	H	VH	VH	VH	H	VH	★ HARDEST



LEGEND

VL = Very Low L = Low M = Medium H = High VH = Very High

Toxic Effect: rating derived from reduction in the natural enemy numbers due to toxic effect after spraying

★ Rating: derived from an average toxic effect on all the natural enemies by the product group after spraying


Prepared by Bronwyn Walsh with other members of the Horticulture Australia Ltd. National Diamondback moth project team. For enquiries phone Bronwyn of DPI&F: (07) 5466 2222

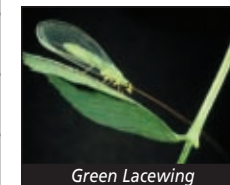
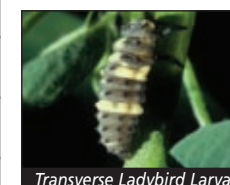
* Acknowledgements: The authors gratefully acknowledge the following people for permission to use data from their research; Mo & Baker; Endersby, Ridland & Guo; Wilson, Holloway, Mensah & Murray. The Good Bug Book 2nd Edition, published by Australasian Biological Control; and Cotton IPM Guidelines 2001 Field Guide. Produced July 2005.


IMPACT OF INSECTICIDES ON NATURAL ENEMIES FOUND IN BRASSICA VEGETABLES

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INSECTICIDES	PESTS  Indicates a pest targeted by at least some products in the insecticide group as at July 2005.									RATING OF INSECTICIDE IMPACT ON NATURAL ENEMIES OVERALL*
	Diamondback moth	Centre Grub	Cabbage Cluster Caterpillar	Cluster Caterpillar	Heliiothis	Cabbage White Butterfly	Aphids	Thrips	Silverleaf Whitefly	
Active Ingredient										The Natural Enemies Assessed; Larval, Egg and Pupal Parasitoids Predatory Beetles Predatory Bugs Lacewings Spiders
Bacillus thuringiensis (Bt)										★ ★ ★ ★ ★ SOFTEST
pirimicarb (Pirimor®)										★ ★ ★ ★ ↘
pymetrozine (Chess®)										★ ★ ★ ★
spinosad (Success®, Entrust®)										★ ★ ★ ↘
emamectin benzoate (Proclaim®)										★ ★ ★ ↘
imidacloprid (Confidor®) soil										★ ★ ★ ↘
indoxacarb (Avatar®)										★ ★ ★ ↘
chlorfenapyr (Secure®)										★ ★ ★
endosulfan										★ ★ ★
fipronil (Regent®)										★ ★ ↘
imidacloprid (Confidor®) foliar										★ ★ ↘
organophosphates										★ ★ ↘
methomyl (Lannate®, Marlin®, Nudrin®, Electra®)										★ ★
synthetic pyrethroids										★ HARDEST



LEGEND  = a pest targeted by at least some products in the insecticide group as at July 2005

R = known resistance in most states **R*** = known resistance in QLD & NSW

★ Rating: derived from an average toxic effect on all the natural enemies by the product group after spraying.

Australian Government
Department of Agriculture, Fisheries and Forestry

VERSION 2



Know-how for Horticulture™

Flip this chart to see a breakdown of the impact on the natural enemies