

BIOLOGICAL CONTROL STRATEGY FOR GREENHOUSE GERBERA PRODUCTION



GLOBAL HORTICULTURAL INC. CONTROL AGENTS FOR GREENHOUSE GERBERA

PEST	BCA	PRODUCT	RATE		TIMING	COMMENTS
			m ²	ft ²		
Whitefly Greenhouse whitefly <i>(Trialeurodes vaporariorum)</i> Silverleaf whitefly <i>(Bemisia tabaci)</i> Note: If <i>Amblyseius swirskii</i> is released for whitefly it will also help in controlling thrips. <i>A. swirskii</i> requires temperatures >20°C (68°F) for optimal performance.	<i>Amblyseius swirskii</i>	<i>Swirskii</i> sachets	1	0.1	Start at first signs of whitefly. Release every 4 weeks. Curative --> introduce every 2 weeks.	Hang sachets between the crop. Avoid hanging them in direct sunlight or close to heating pipes.
		<i>Swirskii</i> loose	100-150	10-15	Release every 1-2 weeks. Curative --> 300-400 / m ² .	Distribute evenly over leaf canopy.
	<i>Encarsia formosa</i> & <i>Eretmocerus eremicus</i>	<i>Encarsia</i> / <i>Eretmocerus</i> mix	5-10	0.5-1	Start at first signs of whitefly. Release every week until whitefly is controlled. Curative --> min. 10 / m ² every week until whitefly is controlled.	Optimal introduction method for <i>Eretmocerus</i> wasps are blister packs. Keep blister packs (cards) out of direct sunlight and open release flap on the back.
	<i>Delphastus catalinae</i>	<i>Delphastus</i> adults	In hotspots		Release in hotspots of whitefly.	<i>Delphastus</i> requires high numbers of whitefly.
Thrips, Western Flower Thrips <i>(Frankliniella occidentalis)</i> & others Note: <i>Amblyseius cucumeris</i> will also help with controlling spider mites and broad mites. <i>A. cucumeris</i> can be used year round.	<i>Amblyseius cucumeris</i>	<i>Cucumeris</i> sachets	1	0.1	Start at first signs of thrips. Release every 4 weeks. Curative --> introduce sachets every 2 weeks.	Hang sachets between the crop. Avoid hanging them in direct sunlight or close to heating pipes.
		<i>Cucumeris</i> loose	150-200	15-20	Release every week. Curative --> 400 / m ² every week.	Distribute evenly over leaf canopy.
	<i>Stratiolaelaps scimitus</i> (<i>Hypoaspis miles</i>)	<i>Stratiolaelaps</i> loose	100	10	At propagator and/or just before planting in the greenhouse.	<i>Stratiolaelaps</i> is a soil dwelling mite that needs a moist environment for optimal development.
	<i>Orius insidiosus</i>	<i>Orius</i> adults	3-5	0.3-0.5	Release 4 consecutive weekly introductions in hotspots. For optimal establishment and carry over to the gerbera crop, ornamental pepper banker plants are recommended.	For optimal establishment and development also apply <i>Ephestia</i> eggs for 5-6 consecutive weeks.
			Use a minimum of 80-100 banker plants per ha. Release 2-3 <i>Orius</i> per banker plant per week.			

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Two-spotted spider mites (<i>Tetranychus urticae</i>) Note: <i>Amblyseius andersoni</i> / <i>Amblyseius californicus</i> will also help in controlling broad mites. <i>P. persimilis</i> , <i>A. andersoni</i> and <i>A. californicus</i> can be used year round.	<i>Amblyseius andersoni</i> or <i>Amblyseius californicus</i>	<i>Andersoni</i> / <i>californicus</i> sachets	1 sachet per 2-3 linear meter bed		Best results are achieved with sachets early in the season, but can also be released as loose application. Repeat introduction with heavy infestations.	Hang sachets between the crop. Avoid hanging them in direct sunlight or close to heating pipes.
		<i>Andersoni</i> / <i>californicus</i> loose	6-10	0.6-1		Distribute evenly over leaf canopy.
	<i>Phytoseiulus persimilis</i>	<i>Phytoseiulus</i> loose	10-20	1-2	Start when first spider mites are detected. Repeat weekly for 3-4 weeks until mites are controlled. Curative --> 100-150 / m ² in and around hotspots.	Turn the bottle slowly during use for a more even distribution of the mites. Sprinkle material on the bigger leaves in the center of the plant and avoid introduction in bright sunlight.
Leafminer (<i>Liriomyza trifolii</i>)	<i>Diglyphus isaea</i>	<i>Diglyphus</i> adults	0.25	0.025	Start at first signs of leafminer. Release every week for at least 4 weeks until sufficient parasitism has been established. Curative --> 1 / m ² every week.	Introduce <i>Diglyphus</i> early morning or later in evening to avoid stress.
Aphids - smaller species: Green peach aphid, Cotton melon aphid (<i>Aphis gossypii</i>, <i>Myzus persicae</i>)	<i>Aphidius colemani</i>	<i>Colemani</i> adults / mummies	0.25-1	0.025-0.1	Release weekly. Curative --> 1 / m ² weekly until control of aphids has been achieved.	Use in combination with banker plants.
	<i>Rhopalosiphum padi</i>	Aphid banker plants	Minimum 1 / acre (2.5 / ha)		Introduce weekly. Initial introduction is 2 banker plants per acre.	
	<i>Aphidoletes Aphidimyza</i>	<i>Aphidoletes</i> pupae	1	0.1	Release at first signs of aphids. Release weekly until control of aphids has been achieved.	Be aware of diapause between Mid-October and beginning of March.
	<i>Chrysoperla spp.</i>	<i>Chrysoperla</i> larvae	10-20	1-2	Release in hotspots of aphids. Works as a quick knock down.	
	<i>Hippodamia convergens</i>	<i>Hippodamia</i> adults	10-20	1-2	Release in hotspots of aphids. Works as a quick knock down.	
Aphids - larger species: Potato aphid, Foxglove aphid (<i>Macrosiphum euphorbiae</i>, <i>Aulacorthum solani</i>)	<i>Aphidius ervi</i>	<i>Ervi</i> adults / mummies	0.25-1	0.025-0.1	Release weekly. Curative --> 1 / m ² weekly until control of aphids has been achieved.	
	<i>Aphidoletes Aphidimyza</i>	<i>Aphidoletes</i> pupae	1	0.1	Release at first signs of aphids. Release weekly until control of aphids has been achieved.	Be aware of diapause between Mid-October and beginning of March.
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	<i>Hippodamia convergens</i>	<i>Hippodamia</i> adults	10-20	1-2	Release in hotspots of aphids. Works as a quick knock down.	
Broad mites (<i>Polyphagotarsonemus latus</i>)	<i>Amblyseius cucumeris</i>	<i>Cucumeris</i> sachets	1	0.1	Release every 4 weeks.	Hang sachets between the crop. Avoid hanging them in direct sunlight or close to heating pipes.
		<i>Cucumeris</i> loose	200	20	Release every 1-2 weeks. Curative --> 300-400 / m ² .	Distribute evenly over leaf canopy.