

# BIOLOGICAL CONTROL STRATEGIES FOR POINSETTIA & POTTED CHRYSANTHEMUMS PRODUCTION



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## BIOLOGICAL CONTROL STRATEGY FOR POINSETTIA & POTTED CHRYSANTHEMUM PRODUCTION

Whitefly development relative to temperature	Sweet potato whitefly		Greenhouse whitefly	
	60°F/ 16 °C	80°F/ 27 °C	60°F/ 16 °C	80°F/ 27 °C
EGG	21	6	16	7
LARVAE 1 (L1)	12	4	8	4
L2	9	3	5	2
L3	10	3	5	2
L4/pupa	18	6	15	7
TOTAL	70	22	49	22



## BIOLOGICAL CONTROL STRATEGIES FOR POINSETTIA & POTTED CHRYSANTHEMUMS PRODUCTION

The use of biological control agents (BCAs) in ornamental crops has been of interest to growers as it has become increasingly difficult to control thrips with traditional pesticides alone. BCAs are excellent resistance management tools. Since they can be distributed very early in the crop cycle during propagation, they are excellent for preventing pest populations from establishing.

### GROWERS NOTES:





BIOLINE'S BIOLOGICAL CONTROL AGENTS FOR POTTED CHRYSANTHEMUMS

PEST	BCA	PRODUCT	RATE		TIMING	COMMENTS
			m2	ft2		
Thrips ( <i>Frankliniella occidentalis</i> )	<i>Amblyseius cucumeris</i>	Amblyline Loose	100	10	Apply weekly during propagation.	Broadcast evenly or use battery-operated blower.
		Amblyline Stick - Mini Sachet	1 sachet per propagation tray, shuttle tray or pot.		Place sachet at sticking/seeding and again during transplanting into pots or hanging baskets.	Place a minimum of 1 Amblyline Stick per 4, 5 or 6-inch shuttle tray. Larger pots that are individually placed need 1 sachet per pot. Will also control broad mites.
	<i>Orius insidiosus</i>	Oriline i	5 - 10	0.5 - 1	Release in hot spots.	Consider using pepper banker plants.
	<i>Stratiolaelaps scimitus</i> ( <i>Hypoaspis miles</i> )	Hypoline	100	10	Apply at sticking and tranplanting.	If applied at rooting stage, second application should be half rate at transplanting.
	<i>Dalotia coriaria</i> ( <i>Atheta coriaria</i> )	Staphyline	2	0.2		
Two-spotted Spider Mite ( <i>Tetranychus urtica</i> )	<i>Amblyseius andersonii</i>	Anderline	4 - 6	0.4 - 0.6	Release together as mixed application with <i>Amblyseius cucumeris</i> in propagation.	
	<i>Phytoseiulus persimilis</i>	Phytoline		0.6 to 0.8	Start when first mites are detected. Repeat weekly for 3 to 4 weeks until <i>Phytoseiulus</i> is established and mites are controlled.	Early detection improves results. Consider using indicator plants (bush beans).
Fungus gnats & Shore flies ( <i>Bradysia spp</i> )	<i>Stratiolaelaps scimitus</i> ( <i>Hypoaspis miles</i> )	Hypoline	100	10	Apply at sticking and tranplanting.	If applied at rooting stage, second application should be half rate at transplanting.
	<i>Dalotia coriaria</i> ( <i>Atheta coriaria</i> )	Staphyline	2	0.2		
	<i>Steinernema feltiae</i>	Exhibitline sf	250K	25K	Apply at sticking and repeat twice during rooting stage. Reapply immediately after transplanting.	Correct application is critical for efficacy. Make sure solution is agitated, fine filters are removed and pressure is kept low. Also control thrips as a spray.
Leafminers ( <i>Liriomyza trifolii</i> )	<i>Diglyphus isaea</i>	Digline	0.25 - 1	0.025 - 0.1	Release weekly for 3 to 4 weeks until sufficient parasitism has been established.	Start releasing at first signs of leafminer (feeding and oviposition spots).
Aphids ( <i>Aphis gossypii</i> , <i>Myzus persicae</i> , <i>Myzus nicotianae</i> )	<i>Aphidius colemani</i>	Aphiline	0.25 - 1	0.025 - 0.1	Release weekly and/or use in combination with aphid banker plants.	<i>Aphidius matricariae</i> is more aggressive towards <i>Myzus nicotianae</i> ('red' aphid).
	<i>Rhopalosiphum padi</i>	Aphid banker plant	1 / acre (2.5 / ha) minimum		Apply every other week.	Initial introduction is 2 per acre.
	<i>Aphidoletes aphidimyza</i>	Aphidoline	1	0.1	Release at first signs of aphids. Continue weekly releases until control has been achieved.	
	<i>Chrysoperla spp</i>	Chrysoline	10 - 20	1 - 2	Use hot spot treatment only for a quick knock down.	
Caterpillars/ loopers ( <i>several spp</i> )	<i>Bacillus thuringiensis</i>	For example, DiPel WP biological insecticide	Follow Label.		Apply at first signs.	

Dipping at sticking and/or planting:			Per 12 to 15 gallons	
Thrips, fungus gnats and others	<i>Beauveria bassiana</i> (strain GHA) - Use WP formulation		See label.	Keep solution in agitation. Refresh dipping solution as often as needed.
	<i>Trichoderma harzianum</i> strain T-22 and <i>Trichoderma virens</i> strain G-41		See label.	
	Exhibitline Sf biological control agent		See label.	

BIOLINE’S BIOLOGICAL CONTROL AGENTS FOR POINSETTIA

PEST	BCA	PRODUCT	RATE		TIMING	COMMENTS
			m2	ft2		
Whiteflies  ( <i>Trialeurodes vaporariorum</i> and/or <i>Bemisia tabaci</i> )	<i>Eretmocerus eremicus</i>	Eretline	10	1	Start second week after sticking cuttings or immediately after planting. Repeat weekly.	Optimal introduction method for <i>Eretmocerus eremicus</i> is blister packs, <i>Eretmocerus</i> is also available on cards. Keep blister packs (cards) out of direct sunlight.
	<i>Amblyseius swirskii</i>	Swirskiline	50	5	First introduce on rooted cuttings just before transplant. Second introduction just prior to spacing.	Introduction of <i>Amblyseius Swirskii</i> is timed to coincide with the maximum foliage cover to ensure the greatest number of mites get on to the plants.
		Swirskiline Stick - mini sachet	1 sachet for each 10” pot for large poinsettias or for each pot for all stock plants.		Place sachet at sticking/seeding and again during transplanting into larger pots.	Larger pots that are individually placed need one Swirskiline Stick sachet per pot.
Fungus gnats & Shore flies ( <i>Bradysia spp</i> )	<i>Stratiolaelaps scimitus</i> ( <i>Hypoaspis miles</i> )	Hypoline	100	10	Apply at sticking and transplanting.	If applied at rooting stage, second application should be half rate at transplanting.
	<i>Dalotia coriaria</i> ( <i>Atheta coriaria</i> )	Staphyline	2	0.2		
	<i>Steinernema feltiae</i>	Exhibitline sf	250K	25K	Apply at sticking and repeat twice during rooting stage. Reapply immediately after transplanting.	Correct application is critical for efficacy. Make sure solution is agitated, fine filters are removed and pressure is kept low..
Two-spotted spider mites ( <i>Tetranychus urticaea</i> )	<i>Phytoseiulus persimilis</i>	Phytoline	6 - 8	0.6 - 0.8	Start when first mites are detected. Repeat weekly for 3 - 4 weeks until <i>Phytoseiulus</i> is established and mites are controlled.	Check mite species. <i>Phytoseiulus</i> does not work well on Lewis mite.
Lewis Mites ( <i>Eotetranychus lewisi</i> )	<i>Amblyseius andersonii</i>	Anderline	4 - 6	0.4 - 0.6	Start when first mites are detected. Repeat weekly for 3 to 4 weeks unti mites are controlled.	
Thrips ( <i>Frankliniella occidentalis</i> )	<i>Amblyseius swirskii</i>	Swirskiline	50	5	First introduce on rooted cuttings just before transplant. Second introduction just prior to spacing.	Western Flower Thrips (WFT) do not produce well on poinsettia. Typically WFT will decrease naturally in poinsettia crops. <i>Echinothrips americanus</i> can establish on poinsettia but they require a different approach.
		Swirskiline Stick - mini sachet	1 sachet for each 10” pot for large poinsettias or for each pot for all stock plants.		Place sachet at sticking/seeding and again during transplanting into larger pots.	Larger pots that are individually placed need one Swirskiline Stick sachet per pot.
	<i>Stratiolaelaps scimitus</i> ( <i>Hypoaspis miles</i> )	Hypoline	100	10	Apply at sticking and transplanting.	If applied at rooting stage, second application should be half rate at transplanting.
	<i>Dalotia coriaria</i> ( <i>Atheta coriaria</i> )	Staphyline	2	0.2		