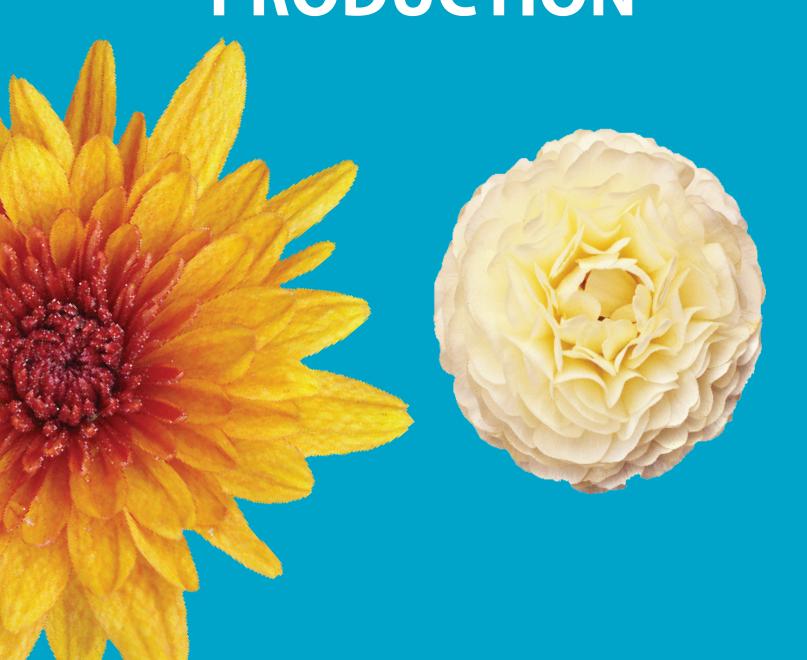
## BIOLOGICAL CONTROL STRATEGIES FOR **POINSETTIA & POTTED CHRYSANTHEMUMS PRODUCTION**



**VISIT** 

TO DISCOVER OUR FULL PORTFOLIO OF **BIOSOLUTIONS** 

**CONTACT THE BIOLINE TEAM:** 

AND DON'T FORGET TO...

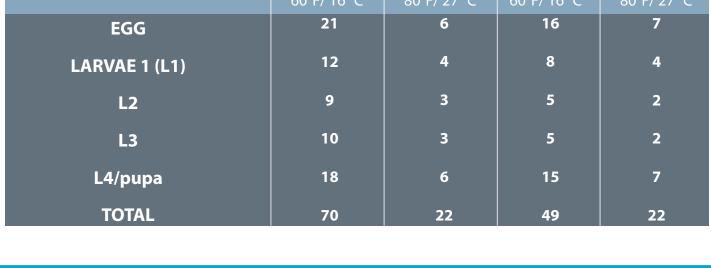
STAY UPDATED WITH BIOLINE'S LATEST **DEVELOPMENTS BY FOLLOWING US ON TWITTER:** 





to temperature	Sweet p white		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 STRATEGY** 



**GROWERS NOTES:** 



## 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.







## BIOLINE'S BIOLOGICAL CONTROL AGENTS FOR POTTED CHRYSANTHEMUMS

PEST BCA		PRODUCT RATE		TIMING	COMMENTS		
PCST	ВСА	PRODUCT	m2	ft2	TIMING	COMMENTS	
Thrips (Frankliniella occidentalis)	Amblyseius cucumeris	Amblyline Loose	100	10	Apply weekly during propagation.	Broadcast evenly or use battery-operated blower.	
		Mini Sachet propagation tray, an		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.		
	Orius insidiosus	Oriline i	5 - 10	0.5 - 1	Release in hot spots.	Consider using pepper banker plants.	
	Stratiolaelaps scimitus (Hypoaspis miles)	Hypoline	100	10	Apply at sticking and	If applied at rooting stage, second application should be half rate at transplanting.	
	Dalotia coriaria (Atheta coriaria)	Staphyline	2	0.2	tranplanting.		
Tшо-spotted Spider Mite (Tetranychus urtica)	Amblyseius andersonii	Anderline	4-6	0.4 - 0.6	Release together as mixed application with <i>Amblyseius cucumeris</i> in propagation.		
	Phytoseiulus persimilis	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 (Bradysia spp)	Stratiolaelaps scimitus (Hypoaspis miles)	Hypoline	100	10	Apply at sticking and	If applied at rooting stage, second application should be half rate at transplanting.	
	Dalotia coriaria (Atheta coriaria)	Staphyline	2	0.2	tranplanting.		
	Steinernema feltiae	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 (Liriomyza trifolii)	Diglyphus isaea	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 (Aphis gossypii, Myzus persicae, Myzus nicotianae)	Aphidius colemani	Aphiline	0.25 - 1	0.025 - 0.1	Release weekly and/or use in combination with aphid banker plants.	Aphidius matricariae is more aggressive towards Myzus nicotianae ('red' aphid).	
	Rhopalosiphum padi	Aphid banker plant	1 / acre (2.5 / ha) minimum		Apply every other week.	Initial introduction is 2 per acre.	
	Aphidoletes aphidimyza	Aphidoline	1			itinue weekly releases until control has been achieved.	
	Chrysoperla spp	Chrysoline	10 - 20	1 - 2	Use hot spot treatment only for a c	juick knock down.	
Caterpillars/loopers (several spp)	Bacillus thuringiensis	For example, DiPel WP biological insecticide	Follow Label.		Apply at first signs.		

Dipping at sticking and/or planting:		Per I2 to I5 gallons	
Thrips, fungus	Beauveria bassiana (strain GHA) - Use WP formulation	See label.	
	Trichoderma harzianum strain T-22 and Trichoderma virens strain G-41	See label.	Keep solution in agitation. Refresh dipping solution as often as needed.
	Exhibitline Sf biological control agent	See label.	

ft2

m2

100

**TIMING** 

Apply at sticking and transplanting.

**COMMENTS** 

If applied at rooting stage, second application should be half rate at transplanting.

## **BIOLINE'S BIOLOGICAL CONTROL AGENTS FOR POINSETTIA PRODUCT** PEST BCA

Stratiolaelaps scimitus

(Hypoaspis miles)

Dalotia coriaria

(Atheta coriaria)

Hypoline

Staphyline

Whiteflies	Eretmocerus eremicus	Eretline	10	1	Start second week after sticking cut- tings 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.
(Trialeurodes vaporariorum and/or Bemisia tabaci)	Amblyseius swirskii	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 foilage 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 (Bradysia spp)	Stratiolaelaps scimitus (Hypoaspis miles)	Hypoline	100	10	Apply at sticking and	If applied at rooting stage, second application should be half rate at transplanting.
	Dalotia coriaria (Atheta coriaria)	Staphyline	2	0.2	transplanting.	
	Steinernema feltiae	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
Тшо-spotted spider mites (Tetranychus urticea)	Phytoseiulus persimilis	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 (Eotetranychus lewisi)	Amblyseius andersonii	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 (Frankliniella occidentalis)	Amblyseius swirskii	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			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.

0.2