

BALL MUMS
2022-2023

GROWING GUIDE

BaïSeed®

Natural Season Garden Mums

Flowering Sequence

Top Performers in bold. 

Grower Ship Date (left) is approximately 7-10 days earlier than Flowering Date

Flowering Date = 30-50% open flowers



Very Early < Sept 9					Early Sept 10-18				Mid-Season Sept 19-26			
Color	Variety	Form	Vigor	Flower Date	Variety	Form	Vigor	Flower Date	Variety	Form	Vigor	Flower Date
White	Aspen White	Decorative	Medium	9/12	Celestial White	Decorative	Medium	9/20	Celestial White	Decorative	Medium	9/20
	Bridal White	Decorative	Medium/Tall	9/15	Starburst White	Decorative	Medium/Short	9/20	Starburst White	Decorative	Medium/Short	9/20
	Moonglow White	Decorative	Medium	9/15	Carousel White	Decorative	Medium	9/26	Carousel White	Decorative	Medium	9/26
Yellow/Gold	Sunrise Yellow	Decorative	Medium	9/7	Buttercup Yellow	Decorative	Medium	9/13	Tribeca Yellow	Decorative	Medium	9/21
	Goldmine Yellow	Decorative	Medium/Tall	9/9	Katelli Yellow	Decorative	Medium	9/13	Stellar Yellow	Decorative	Medium	9/22
					Kizzmet Golden Yellow	Decorative	Medium	9/13	Honeyblush Yellow	Decorative	Medium	9/23
					Goldcrest Yellow	Decorative	Medium	9/14	Cracklin Golden Yellow	Duplex	Medium/Short	9/24
					Moonglow Yellow	Decorative	Medium	9/17	Zinger Yellow	Decorative	Medium	9/24
Green								Sizzling Fire Yellow	Decorative	Medium	9/25	
Salmon								Gold Cup Yellow	Decorative	Short	9/26	
Pink/Lavender					Misty Lilac Pink	Decorative	Medium	9/18	Carousel Blushing Salmon	Decorative	Medium	9/26
					Stellar Pink	Decorative	Medium	9/21	Stellar Pink	Decorative	Medium	9/21
					Tribeca Pink	Decorative	Medium/Tall	9/21	Tribeca Pink	Decorative	Medium/Tall	9/21
					Perfectly Pink	Decorative	Medium/Short	9/22	Perfectly Pink	Decorative	Medium/Short	9/22
					Temptation Pink	Decorative	Medium	9/22	Temptation Pink	Decorative	Medium	9/22
					Flamingo Pineapple Pink	Decorative	Medium	9/23	Flamingo Pineapple Pink	Decorative	Medium	9/23
					Wild Child Pink	Decorative	Medium	9/23	Wild Child Pink	Decorative	Medium	9/23
					Whispered Lavender Pink	Duplex	Medium	9/24	Whispered Lavender Pink	Duplex	Medium	9/24
					Carousel Pink	Decorative	Medium	9/26	Carousel Pink	Decorative	Medium	9/26
					Flamingo Neon Pink	Decorative	Medium	9/26	Flamingo Neon Pink	Decorative	Medium	9/26
Purple/Dark Pink					Flamingo Pink	Decorative	Medium	9/26	Flamingo Pink	Decorative	Medium	9/26
					Pink Frenzy	Decorative	Medium/Tall	9/26	Pink Frenzy	Decorative	Medium/Tall	9/26
					Stellar Purple	Decorative	Medium	9/20	Stellar Purple	Decorative	Medium	9/20
					Tribeca Dark Pink	Decorative	Medium	9/23	Tribeca Dark Pink	Decorative	Medium	9/23
Bronze	Autumn Envy Bronze	Decorative	Short	9/8	Katelli Bronze	Decorative	Short	9/15	Fireglow Bronze	Decorative	Medium	9/23
					Hot Spot Bronze	Decorative	Medium	9/18	Trickster Golden Bronze	Decorative	Medium	9/23
									Butternut Golden Bronze	Decorative	Medium/Tall	9/26
Orange					Kickin' Spicy Orange	Decorative	Medium/Tall	9/15	Perfectly Orange	Decorative	Short	9/21
									Tribeca Amber Orange	Decorative	Medium	9/21
									Zuma Orange	Decorative	Medium	9/22
									Fire Halo Orange	Decorative	Medium/Tall	9/24
									Orange Zest	Decorative	Medium	9/25
									Petit Orange	Duplex	Medium	9/25
									Carousel Glimmer Orange	Decorative	Medium	9/26
Red					Five Alarm Red	Decorative	Medium	9/11	Red Hots	Decorative	Medium	9/19
					Cranbury Red	Decorative	Medium	9/17	Stellar Red	Decorative	Short	9/19
									Radiant Red	Decorative	Medium/Tall	9/25

Late Sept 27-Oct 4					Early Season Extender Oct 5-11				Late Season Extender Oct 12+			
Color	Variety	Form	Vigor	Flower Date	Variety	Form	Vigor	Flower Date	Variety	Form	Vigor	Flower Date
White	Paradiso White	Decorative	Medium/Short	9/27	Morgana White	Decorative	Medium/Short	10/7	Alpine White	Decorative	Medium	10/12
	Butter N' Cream White	Decorative	Medium	9/29	Dove White	Decorative	Medium	10/11	Skyfall White	Decorative	Short	10/17
									Avalon Crème White	Decorative	Medium	10/19
Yellow/Gold	Paradiso Yellow	Decorative	Medium/Short	9/27	Morgana Yellow	Decorative	Medium/Short	10/8	Alpine Yellow	Decorative	Medium	10/12
	Sweet Honey Yellow	Decorative	Medium	9/28	Gold Riot Yellow	Decorative	Medium	10/9	Avalon Golden Yellow	Decorative	Medium/Short	10/15
	Sundance Yellow	Decorative	Medium	9/30	Yellow Tang	Decorative	Medium	10/9	Skyfall Lemon Yellow	Decorative	Short	10/15
	Destiny Yellow	Duplex	Medium	10/1	Dove Yellow	Decorative	Medium	10/11	Skyfall Yellow	Duplex	Short	10/15
	Gold Rush Yellow	Decorative	Medium	10/1					Sunny Day Yellow	Decorative	Medium	10/16
Green	Key Lime	Decorative	Medium/Tall	9/27								
Salmon												
Pink/Lavender	Amphion Lavender Purple	Daisy	Medium	9/27	Pop Eye Pink	Duplex	Medium	10/6	Avalon Pink	Decorative	Medium/Short	10/16
	Paradiso Pink	Decorative	Medium/Short	9/27	Jazzberry Pink	Decorative	Medium	10/7	Skyfall Pink	Decorative	Short	10/19
	Skye Pink	Decorative	Medium	9/30	Morgana Pink	Decorative	Medium	10/9				
Purple/Dark Pink	Prism Purple	Decorative	Medium	9/28	Majesty Purple	Decorative	Medium	10/9	Avalon Purple	Decorative	Medium/Short	10/16
	Plumberry Purple	Decorative	Medium	9/30	Morgana Purple	Decorative	Medium/Short	10/9	Skyfall Purple	Decorative	Short	10/17
	Wicked Purple	Decorative	Medium	9/30								
	Paintbox Purple	Decorative	Medium/Short	10/2								
	Grapeberry Neon Purple	Decorative	Medium	10/4								
	Grapeberry Purple	Decorative	Medium	10/4								
Bronze	Paradiso Bronze	Decorative	Medium/Short	9/28	Twilight Bronze	Decorative	Medium	10/10				
Orange	Copper Coin Bronze	Decorative	Medium	9/30								
	Hot Sugar Gold Bronze	Decorative	Medium	9/30								
	Harvest Bronze	Decorative	Short	10/1								
	Autumn Glow Bronze	Decorative	Medium	10/2								
	Sunset Orange	Decorative	Medium	9/27	Pop Eye Orange	Duplex	Medium	10/6	Blazing Orange	Decorative	Medium	10/12
Mumosa Orange	Decorative	Medium	9/28	Morgana Orange	Decorative	Medium	10/8	Avalon Orange	Decorative	Medium/Short	10/16	
				Pumpkin Pie Orange	Decorative	Medium	10/9					
Red	Flamingo Cranberry Red	Decorative	Medium	9/27	Mumma Mia Red	Decorative	Medium/Tall	10/5	Eternal Red	Decorative	Medium/Short	10/14
	Red Ryder	Decorative	Medium	9/28	Red Rover	Decorative	Medium	10/6	Avalon Red	Decorative	Medium/Short	10/15
	Roaring Red	Decorative	Medium	9/29	Morgana Red	Decorative	Medium	10/8	Skyfall Red	Decorative	Short	10/23
	Grapeberry Red	Decorative	Medium	10/4	Majesty Red	Decorative	Medium	10/9				
	Maverick Red	Decorative	Medium/Tall	10/4								

Ball Garden Mums A-Z Quick Reference

● - suggested ★ - highly recommended

Variety	Color	Flowering Form	Growth Habit	Vigor	Timing	Flower Date	Top Performer	Heat Tolerance TX/FL	Pacific NW	Coastal CA	Landscape	Mixed Combos	4"	6"	8"	10"	12"	1/2 Bushel	Hanging Baskets	Spring Flowering	Black Cloth						
																					Response (Wks)	Recommend	4"	6"	8"	10"	12"
Alpine White	White	Decorative	European	Medium	Very Late	10/12	●	●	●		★	●	●	●					●	●	7 Wk	●	●	●	●		
Alpine Yellow	Yellow	Decorative	European	Medium	Very Late	10/12		●	●	●	●	●	●	●					●	●	8 Wk	NO					
Amphion Lavender Purple	Purple	Daisy	European	Medium	Late	9/27		●	●	●		●	●	●	●	●	●	●	●	●	6 Wk	●	●	●	●	●	●
Aspen White	White	Decorative	Mounded	Medium	Early	9/12		●	●	●		●	●	●	●				●		6 Wk	●	●	●	●		●
Autumn Envy Bronze	Bronze	Decorative	Mounded	Short	Very Early	9/8		●			★		●	●	●				●		6 Wk	●		●	●	●	
Autumn Glow Bronze	Bronze	Decorative	Mounded	Medium	Late	10/2		★	★	★		●	●	●	●	●	●	●	●	●	7 Wk	●	●	●	●	●	●
Avalon Crème White	White	Decorative	Mounded	Medium	Very Late	10/19		●	●	●	★	★	●	●	●	●	●	●	★		8 Wk	●	●	●	●	●	●
Avalon Golden Yellow	Yellow	Decorative	Mounded	Medium/Short	Very Late	10/15		●	●	●	●	★	●	●	●	●	●	●	★		8 Wk	●	●	●	●	●	●
Avalon Orange	Orange	Decorative	Mounded	Medium/Short	Very Late	10/16	●	●	●	●	★	★	●	●	●	●	●	●	★		8 Wk	●	●	●	●	●	●
Avalon Pink	Pink	Decorative	Mounded	Medium/Short	Very Late	10/16	●	●	●	●	★	★	●	●	●	●	●	●	★		8 Wk	●	●	●	●	●	●
Avalon Purple	Purple	Decorative	Mounded	Medium/Short	Very Late	10/16	●	●	●	●	★	★	●	●	●	●	●	●	★		8 Wk	●	●	●	●	●	●
Avalon Red	Red	Decorative	Mounded	Medium/Short	Very Late	10/15			●	●		★	●	●	●	●	●	●	★		8 Wk	●	●	●	●	●	●
Avalon Salmon	Coral/Salmon	Decorative	Mounded	Medium/Short	Very Late	10/16	●	●	●	●	●	★	●	●	●	●	●	●	★		8 Wk	●	●	●	●	●	●
Avalon Sunny Yellow	Yellow	Decorative	Mounded	Medium	Very Late	10/19	●	●	●	●	★	★	●	●	●	●	●	●	★		8 Wk	●	●	●	●	●	●
Blazing Orange	Orange	Decorative	Mounded	Medium	Very Late	10/12	●	★	●	●	★		●	●	●	●	●	●	●		7 Wk	●	●	●	●	●	●
Bridal White	White	Decorative	European	Medium/Tall	Early	9/15		★	★	●			●	●	●	●	●		●		6 Wk	●	●	●	●	●	●
Butter N' Cream White	White	Decorative	European	Medium	Late	9/29	●	★	●	★	★		●	●	●	●	●		●		8 Wk	★	●	●	●	●	●
Buttercup Yellow	Yellow	Decorative	European	Medium	Early	9/13			★			●	●	●	●	●	●	●	●		7 Wk	NO					
Butternut Golden Bronze	Bronze	Decorative	European	Medium/Tall	Mid	9/26		●					●	●	●	●	●				7 Wk	●		●	●	●	●
New Carousel Blushing Salmon	Coral/Salmon	Decorative	Mounded	Medium	Mid	9/26		●	●		●	●	●	●	●	●	●		●		7 Wk	●	●	●	●	●	●
New Carousel Glimmer Orange	Orange	Decorative	Mounded	Medium	Mid	9/26		●	●		●	●	●	●	●	●	●		●		7 Wk	●	●	●	●	●	●
Carousel Pink	Pink	Decorative	Mounded	Medium	Mid	9/26	●	●	●		●	●	●	●	●	●	●		●		7 Wk	●	●	●	●	●	●
New Carousel White	White	Decorative	Mounded	Medium	Mid	9/26		●	●		●	●	●	●	●	●	●		●		7 Wk	●	●	●	●	●	●
Celestial White	White	Decorative	European	Medium	Mid	9/20	●		●	★	★		●	●	●	●	●		●		6 Wk	●	●	●	●	●	●
Copper Coin Bronze	Bronze	Decorative	European	Medium	Late	9/30	●	★	★	★	★			●	●	●	●		★		7 Wk	★	●	●	●		●
Cracklin Golden Yellow	Yellow	Duplex	Mounded	Medium/Short	Mid	9/24		●	●	●	●	●	●	●					●		7 Wk	●	●	●			
Cranbury Red	Red	Decorative	Mounded	Medium	Early	9/17		●			★			●	●	●	●		●		7 Wk	●		●	●	●	●
New Destiny Yellow	Yellow	Duplex	Mounded	Medium	Late	10/1		●	●				●	●	●	●	●		●		7 Wk	●	●	●	●	●	●
Dove White	White	Decorative	European	Medium	Very Late	10/11		●	★	●			●	●	●	●			★	●	8 Wk	●	●	●	●	●	●
Dove Yellow	Yellow	Decorative	European	Medium	Very Late	10/11		●	●	●			●	●	●	●			★	●	7 Wk	●	●	●	●	●	●
Eternal Red	Red	Decorative	Mounded	Medium/Short	Very Late	10/14		●		●	●	●	●					●		8 Wk	●	●	●				
Fire Halo Orange	Orange	Decorative	Mounded	Medium/Tall	Mid	9/24		●	●	●				●	●	●	●				7 Wk	NO					
Fireglow Bronze	Bronze	Decorative	European	Medium	Mid	9/23	●	★	★	●			●	●	●	●	●		★		8 Wk	NO					
Five Alarm Red	Red	Decorative	Mounded	Medium	Early	9/11		★	●	●	●	●	●	●	●	●	●		●		6 Wk	●	●	●	●	●	●
Flamingo Cranberry Red	Red	Decorative	European	Medium	Late	9/27			●	●	★	●	●	●	●	●	●		●		8 Wk	NO					
Flamingo Neon Pink	Pink	Decorative	European	Medium	Mid	9/26	●	●	●	●	★	●	●	●	●	●	●		●		8 Wk	NO					
Flamingo Pineapple Pink	Pink	Decorative	European	Medium	Mid	9/23			★	●	★	●	●	●	●	●	●		●		8 Wk	NO					
Flamingo Pink	Pink	Decorative	European	Medium	Mid	9/26		●	★	●	★	●	●	●	●	●	●		●		8 Wk	NO					
Gold Cup Yellow	Yellow	Decorative	European	Short	Mid	9/26		●		●			●	●	●				●		7 Wk	●	●	●	●		●
Gold Riot Yellow	Yellow	Decorative	European	Medium	Very Late	10/9	●	★		★	●		●	●	●	●	●		★	●	8 Wk	★	●	●	●	●	●

Ball Garden Mums A-Z Quick Reference *cont.*

● - suggested ★ - highly recommended

Variety	Color	Flowering Form	Growth Habit	Vigor	Timing	Flower Date	Top Performer	Heat Tolerance TX/FL	Pacific NW	Coastal CA	Landscape	Mixed Combos	4"	6"	8"	10"	12"	1/2 Bushel	Hanging Baskets	Spring Flowering	Black Cloth									
																					Response (Wks)	Recommend	4"	6"	8"	10"	12"	1/2 Bushel	Hanging Baskets	
Gold Rush Yellow	Yellow	Decorative	European	Medium	Late	10/1		●	●	●	★		●	●	●	●	●				7 Wk	●		●	●	●	●	●		
Goldcrest Yellow	Yellow	Decorative	Mounded	Medium	Early	9/14		●		●		●	●	●	●	●	●		●		7 Wk	●	●	●	●	●	●	●	●	
Goldmine Yellow	Yellow	Decorative	European	Medium/Tall	Very Early	9/9		★	★	●			●	●	●	●	●	●		●		6 Wk	●		●	●	●	●	●	
Grapeberry Neon Purple	Purple	Decorative	European	Medium	Late	10/4		●	●	●		●	●	●	●	●	●	●		●	●	7 Wk	●	●	●	●			●	
Grapeberry Purple	Purple	Decorative	European	Medium	Late	10/4		●	●	●	★		●	●	●	●	●	●		●	●	7 Wk	●	●	●	●			●	
Grapeberry Red	Red	Decorative	European	Medium	Late	10/4		●	●	●	★		●	●	●	●	●	●		●	●	8 Wk	●	●	●	●			●	
Gypsy Rose Purple	Purple	Decorative	European	Medium	Mid	9/24			●	●		●	●	●	●	●	●	●		●	●	8 Wk	●	●	●	●	●	●	●	
Harvest Bronze	Bronze	Decorative	European	Short	Late	10/1		●	●	●		●	●	●	●					●		7 Wk	●	●	●	●			●	
Honeyblush Yellow	Yellow	Decorative	European	Medium	Mid	9/23	●	★	●	★	★		●	●	●	●	●	●		★		7 Wk	NO							
Hot Spot Bronze	Bronze	Decorative	Mounded	Medium	Early	9/18							●	●	●	●	●	●				7 Wk	●	●	●	●	●			
Hot Sugar Gold Bronze	Bronze	Decorative	Mounded	Medium	Late	9/30						●	●	●	●	●	●	●		●		8 Wk	NO							
Jazzberry Pink	Pink	Decorative	European	Medium	Very Late	10/7	●	★		●	★		●	●	●	●				●		7 Wk	NO							
Katelli Bronze	Bronze	Decorative	European	Short	Early	9/15		★	●	●		●	●	●						★	●	6 Wk	★	●	●	●			●	
Katelli Yellow	Yellow	Decorative	European	Medium	Early	9/13		●	●			●	●	●						★	●	6 Wk	●	●	●	●			●	
Key Lime	Green	Decorative	European	Medium/Tall	Late	9/27		●	●			●	●	●	●					●		7 Wk	●	●	●	●			●	
New Kickin' Spicy Orange	Orange	Decorative	Mounded	Medium/Tall	Early	9/15		●	●				●	●	●	●						7 Wk	●		●	●	●	●		
Kizzmet Golden Yellow	Yellow	Decorative	European	Medium	Early	9/13						●	●	●	●	●	●	●		●		8 Wk	●	●	●	●	●	●	●	
Majesty Purple	Purple	Decorative	European	Medium	Very Late	10/9		●	●	★	★	★	●	●	●	●	●	●	●	●	●	7 Wk	★	●	●	●	●	●	●	●
Majesty Red	Red	Decorative	European	Medium	Very Late	10/9		●	●	★	★	★	●	●	●	●	●	●	●	●	●	7 Wk	●	●	●	●	●	●	●	●
New Maverick Red	Red	Decorative	Mounded	Medium/Tall	Late	10/4		●	●				●	●	●	●	●	●		●		7 Wk	NO							
Misty Lilac Pink	Pink	Decorative	Mounded	Medium	Early	9/18	●	●	●	●		●	●	●	●	●						6 Wk	●	●	●	●	●	●	●	
Moonglow White	White	Decorative	European	Medium	Early	9/15		★	●	●		●	●	●	●	●	●	●		●		7 Wk	●	●	●	●	●		●	
Moonglow Yellow	Yellow	Decorative	European	Medium	Early	9/17		●	●	●		●	●	●	●	●	●	●		●		7 Wk	★	●	●	●	●		●	
Morgana Orange	Orange	Decorative	Mounded	Medium	Very Late	10/8		●	●	●		●	●	●	●	●	●	●		★	●	8 Wk	●	●	●	●	●	●	●	
New Morgana Pink	Pink	Decorative	Mounded	Medium	Very Late	10/9		●	●	●		●	●	●	●	●	●	●		★	●	8 Wk	●	●	●	●	●	●	●	
Morgana Purple	Purple	Decorative	Mounded	Medium/Short	Very Late	10/9		●	●	●		●	●	●	●	●	●	●		★	●	8 Wk	●	●	●	●	●	●	●	
Morgana Red	Red	Decorative	Mounded	Medium	Very Late	10/8		●	●	●		●	●	●	●	●	●	●		★	●	8 Wk	●	●	●	●	●	●	●	
Morgana White	White	Decorative	Mounded	Medium/Short	Very Late	10/7		●	●	●		●	●	●	●	●	●	●		★	●	8 Wk	●	●	●	●	●	●	●	
Morgana Yellow	Yellow	Decorative	Mounded	Medium/Short	Very Late	10/8		●	●	●		●	●	●	●	●	●	●		★	●	8 Wk	●	●	●	●	●	●	●	
Mumma Mia Red	Red	Decorative	European	Medium/Tall	Very Late	10/5	●	●					●	●	●	●	●	●				8 Wk	●	●	●	●				
Mumosa Orange	Orange	Decorative	European	Medium	Late	9/28	●	●					●	●	●	●				●		7 Wk	●	●	●	●	●			
Orange Zest	Orange	Decorative	Mounded	Medium	Mid	9/25		★		●	★		●	●	●	●	●	●		●		8 Wk	NO							
Paintbox Purple	Purple	Decorative	Mounded	Medium/Short	Late	10/2		★		★		●	●	●	●	●				★		7 Wk	●	●	●	●	●			
Paradiso Bronze	Bronze	Decorative	European	Medium/Short	Late	9/28			●	●		★	●	●	●	●				★	●	7 Wk	★	●	●	●			●	
Paradiso Pink	Pink	Decorative	European	Medium/Short	Late	9/27			●	●		★	●	●	●	●				★	●	7 Wk	★	●	●	●			●	
Paradiso White	White	Decorative	European	Medium/Short	Late	9/27		●	●	●		★	●	●	●	●				★	●	7 Wk	★	●	●	●			●	
Paradiso Yellow	Yellow	Decorative	European	Medium/Short	Late	9/27			●	●		★	●	●	●	●				★	●	7 Wk	★	●	●	●			●	
Perfectly Orange	Orange	Decorative	Mounded	Short	Mid	9/21		●	●	●		●	●	●	●					●		7 Wk	●	●	●				●	
Perfectly Pink	Pink	Decorative	Mounded	Medium/Short	Mid	9/22		●	●	●		●	●	●	●					●		7 Wk	●	●	●				●	

Ball Garden Mums A-Z Quick Reference *cont.*

● - suggested ★ - highly recommended

Variety	Color	Flowering Form	Growth Habit	Vigor	Timing	Flower Date	Top Performer	Heat Tolerance TX/FL	Pacific NW	Coastal CA	Landscape	Mixed Combos	4"	6"	8"	10"	12"	1/2 Bushel	Hanging Baskets	Spring Flowering	Black Cloth								
																					Response (Wks)	Recommend	4"	6"	8"	10"	12"	1/2 Bushel	Hanging Baskets
Petit Orange	Orange	Duplex	European	Medium	Mid	9/25		●	●	●	★		●	●	●	●	●	●	●	●	7 Wk	★	●	●	●	●	●	●	●
Pink Frenzy	Pink	Decorative	Mounded	Medium/Tall	Mid	9/26		★		★			●	●	●	●	●	●			7 Wk	●		●	●	●	●	●	●
Plumberry Purple	Purple	Decorative	Mounded	Medium	Late	9/30	●	●	●	●	★		●	●	●	●	●	●	●	●	7 Wk	★	●	●	●	●	●		●
Pop Eye Orange	Orange	Duplex	Mounded	Medium	Very Late	10/6		●		●		★	●	●	●	●	●		●	●	8 Wk	●	●	●	●				
Pop Eye Pink	Pink	Duplex	Mounded	Medium	Very Late	10/6		●		●		★	●	●	●	●	●		●	●	8 Wk	●	●	●	●				
Poppin Purple	Purple	Duplex	European	Medium	Mid	9/24	●	●			★			●	●	●	●		●	●	7 Wk	●		●	●	●	●		●
Prism Purple	Purple	Decorative	European	Medium	Late	9/28			●	●			●	●	●	●	●	●	●	●	8 Wk	●	●	●	●	●	●	●	●
Pumpkin Pie Orange	Orange	Decorative	European	Medium	Very Late	10/9		●	●	★				●	●	●	●	●		●	7 Wk	●	●	●	●	●	●		●
Radiant Red	Red	Decorative	European	Medium/Tall	Mid	9/25	●	★		●	★			●	●	●	●	●			7 Wk	●		●	●	●	●	●	●
Red Hots	Red	Decorative	Mounded	Medium	Mid	9/19		★	★	●	★		●	●	●	●	●	●	●	●	7 Wk	●	●	●	●	●			●
Red Rover	Red	Decorative	European	Medium	Very Late	10/6		●	●	●			●	●	●	●	●	●	★	●	7 Wk	●	●	●	●				●
Red Ryder	Red	Decorative	European	Medium	Late	9/28	●	★	★	★	★		●	●	●	●	●	●	★		8 Wk	★		●	●	●			●
New Roaring Red	Red	Decorative	Mounded	Medium	Late	9/29		●	●				●	●	●	●	●		●	●	8 Wk	●	●	●	●	●	●		●
New Sizzling Fire Yellow	Yellow	Decorative	Mounded	Medium	Mid	9/25		●	●				●	●	●	●	●		●	●	7 Wk	NO							
Skye Pink	Pink	Decorative	European	Medium	Late	9/30							●	●	●	●	●	●	●	●	7 Wk	NO							
Starburst White	White	Decorative	European	Medium/Short	Mid	9/20	●	★		●			●	●	●	●	●	●	●	●	7 Wk	★	●	●	●				●
Stellar Pink	Pink	Decorative	European	Medium	Mid	9/21		★	●	●		★	●	●	●	●	●	●	★		7 Wk	★	●	●	●	●			●
Stellar Purple	Purple	Decorative	European	Medium	Mid	9/20		★	★	●		★	●	●	●	●	●	●	★		7 Wk	★	●	●	●	●			●
Stellar Red	Red	Decorative	European	Short	Mid	9/19		●	●	●		★	●	●	●	●	●	●	★		7 Wk	★	●	●	●	●			●
Stellar Yellow	Yellow	Decorative	European	Medium	Mid	9/22		●	●	●		★	●	●	●	●	●	●	★		7 Wk	★	●	●	●	●			●
Sundance Yellow	Yellow	Decorative	European	Medium	Late	9/30	●	★	★	●	★		●	●	●	●	●	●	●	●	8 Wk	●	●	●	●	●			●
Sunny Day Yellow	Yellow	Decorative	European	Medium	Very Late	10/16	●	●	●	★			●	●	●	●	●	●	●	●	7 Wk	●	●	●	●	●			●
Sunrise Yellow	Yellow	Decorative	Mounded	Medium	Very Early	9/7	●	★		★			●	●	●	●	●	●	★		7 Wk	★	●	●	●				●
Sunset Orange	Orange	Decorative	European	Medium	Late	9/27	●	●	★	●			●	●	●	●	●	●	●	●	7 Wk	★	●	●	●	●	●	●	●
Sweet Honey Yellow	Yellow	Decorative	European	Medium	Late	9/28							●	●	●	●	●				8 Wk	●	●	●	●	●	●	●	●
Temptation Pink	Pink	Decorative	European	Medium	Mid	9/22		●						●	●	●	●		●	●	7 Wk	●		●	●	●	●	●	●
New Tribeca Amber Orange	Orange	Decorative	Mounded	Medium	Mid	9/21		●	●				●	●	●	●	●		●	●	7 Wk	NO							
New Tribeca Dark Pink	Pink	Decorative	Mounded	Medium	Mid	9/23		●	●				●	●	●	●	●		●	●	7 Wk	NO							
New Tribeca Pink	Pink	Decorative	Mounded	Medium/Tall	Mid	9/21		●	●				●	●	●	●	●		●	●	7 Wk	NO							
New Tribeca Yellow	Yellow	Decorative	Mounded	Medium	Mid	9/21		●	●				●	●	●	●	●		●	●	7 Wk	NO							
Trickster Golden Bronze	Bronze	Decorative	Mounded	Medium	Mid	9/23		●					●	●	●	●	●	●	●		8 Wk	NO							
Twilight Bronze	Bronze	Decorative	European	Medium	Very Late	10/10		●		●			●	●	●	●		●			7 Wk	★	●	●					
Venus Purple	Purple	Decorative	European	Medium	Late	10/4		●	●	●			●	●	●	●	●	●	●	●	7 Wk	●	●	●	●	●	●	●	●
Whispered Lavender Pink	Pink	Duplex	Mounded	Medium	Mid	9/24							●	●	●	●		●			7 Wk	NO							
Wicked Purple	Purple	Decorative	Mounded	Medium	Late	9/30	●							●	●	●	●				7 Wk	●		●	●	●	●		
Wild Child Pink	Pink	Decorative	Mounded	Medium	Mid	9/23		●						●	●	●	●				7 Wk	●		●	●	●	●		
Yellow Tang	Yellow	Decorative	European	Medium	Very Late	10/9	●	★	★	★	★		●	●	●	●	●	●	★	●	7 Wk	★	●	●	●	●	●		●
Zinger Yellow	Yellow	Decorative	Mounded	Medium	Mid	9/24	●	●			★			●	●	●	●				8 Wk	●		●	●	●			
Zuma Orange	Orange	Decorative	European	Medium	Mid	9/22	●	●					●	●	●	●	●	●	●	●	8 Wk	●		●	●	●			

Keys to Producing Quality Garden Mums

Upon Arrival

Ball Garden Mum cuttings are available as both unrooted and rooted liners. All cuttings should be stuck or planted as soon as possible.

Rooted cuttings trays should be placed in the greenhouse with a minimum temperature of 60 to 62°F (16 to 17°C). Do not let the plants wilt, and try to hold for no more than 2 to 3 days. Unrooted cuttings – please refer to “Propagation of Garden Mums,” page 16.



Planting & Media

Planting is the most critical period in the production of a quality Garden Mum crop. Plant liners directly into final container whenever possible. A lighter, well-drained media is preferred. A heavier media may delay rooting, reducing the quality of the finished crop. Avoid mixes that are too light and may dry out too rapidly.

Have containers filled and moist prior to planting. Media starting pH in a soilless mix should be 5.8 to 6.4; a soil-based mix should be 6.0 to 6.5. Thoroughly water liners prior to planting, with 300 to 400 ppm N from 20-10-20, to ensure that the liner is well fed, encouraging rapid establishment.

Water immediately after planting with fertilizer, such as 20-10-20 at 300 to 400 ppm N, to charge the soil – so when roots emerge, strong growth will occur. It may be necessary to mist or syringe the newly planted cuttings for the first few days to prevent wilting.

If outdoor temperatures are cool, 50 to 59°F (10 to 15°C), it is recommended that plants be started in a greenhouse with night temperatures maintained between 60 to 69°F (16 to 21°C), with 65°F (18°C) being ideal. This allows better take-off and initial growth, which is especially important when growing early-flowering varieties. Low night temperatures at planting can promote premature flower initiation.

Garden Mums should be grown in full sun; shaded areas can produce taller, weaker plants.

Pinching

Modern varieties do not require pinching in natural-season Fall crops. Pinching is suggested for black cloth, but many growers produce black cloth crops without pinching.

Spacing

Refer to the chart on page 12 for specific spacing requirements. A key to excellent quality is to space the plants once they start touching. Spacing plants too tightly promotes weak, stretched, poor-quality plants that are more likely to experience disease problems.

Irrigation & Fertilization

A drip irrigation system is often the best choice when growing Garden Mums. It keeps the foliage dry to prevent spotting of the leaves, and also reduces the chance of developing foliar disease problems. When irrigating, apply enough water to thoroughly wet the soil mass, allowing water to drip from the container. Never let the plant wilt during the early stages of production, as wilting can limit growth and reduce the overall plant size.

Mums are heavy feeders and require large amounts of nutrients during early weeks of the plant development. The majority of nutrients in the plant at flowering are in the plant at visible bud. Therefore, feeding early is critical for strong growth. A program of regular soil testing is the best guide to determine the optimum fertilization regimen. High fertilization rates and low soil EC levels indicate that plants are taking up the nutrition. High EC levels indicate plants are not taking up the fertilizer – so fertilizer rates will need to be reduced.

Fertilizing immediately after planting is very important:

- Feed $\text{NH}_4 + \text{P}$ (20-10-20, 20-20-20) during the early crop development (weeks 1-4). A rate of 250 to 350 ppm N will usually work well.
- After loading the plant early, you will want to avoid too much $\text{NH}_4 + \text{P}$, or stretched plants and soft growth will result. Use NO_3 and reduced P (17-5-17, 15-4-15, 14-0-14, etc.) to tone the crop and reduce stretch.
- Once plants are at visible bud, slow the fertilizer uptake and monitor the EC to prevent salt damage to the roots.



Slow-release fertilizers, such as Osmocote, in combination with liquid feeds may also be used. Avoid excess applications of slow-release fertilizers, since they can release rapidly under high temperatures and cause the EC to spike, which damages roots. Mums can benefit from a magnesium sulfate (Epsom salt) supplement. Once plants mature, fertilizer levels should be reduced to maintenance levels.

Premature Budding & Crown Bud Formation

Night temperatures above 68°F (20°C) will delay flower initiation. As night temperatures exceed 75°F (24°C), flowering is inhibited. Several days or more of cool nights, less than 60°F (16°C), in late Spring and early Summer may trigger premature bud formation. This is not desirable and may cause the plants to finish too small.

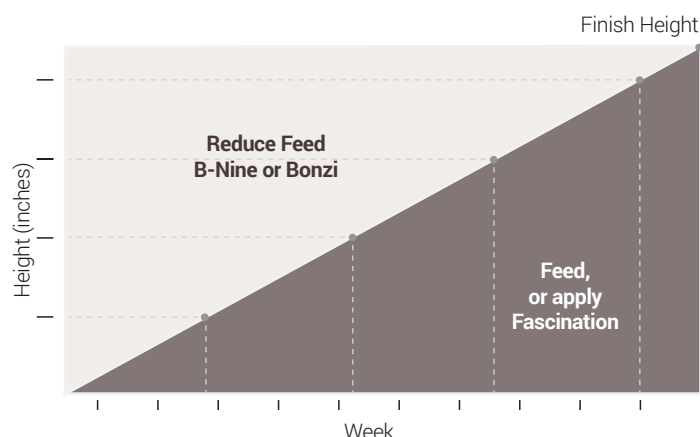
If small buds are visible in the early stages of production, plants will most often still develop normally. Early budding can be minimized by limiting stress, applying adequate fertilizer amounts (fertility levels should be high) and not allowing plants to wilt. Early applications of 500 ppm Florel 1 week after planting can help minimize premature bud set by helping to promote vegetative growth; this will not abort the existing buds.

Success with Florel

- Use low-alkalinity (<60 ppm) water or increase Florel rate.
- Reduce spray solution to pH <4 before adding Florel.
- Don't pour Florel into the tank – use a funnel or put Florel in a bag and empty into the tank.
- Sprench to cover the plants.
- Spray early or late day, as slow drying time maximizes uptake and response.

Tracking Your Crop

Mums are an easy crop to track, and it is important to determine if the crop is on schedule. To do so, simply graph a straight line between initial plant height and desired height at finish. Every week, measure 5 plants in the primary block to see if they are on track. Feed if they are below the line, or use Fascination. If they are above the line, use a PGR to slow them down.



Height Control & Growth Regulators

NOTE: We recommend an initial small-scale trial with all growth regulators.

B-Nine foliar spray applications control height and also produce darker, greener leaves and strong stems. Apply 2,500 to 5,000 ppm when breaks are 1 to 2 in. (3 to 5 cm)

long to tone the plant and reduce stretch. A second application can be made 2 weeks later. Remember that B-Nine application after visible bud will delay flowering. Weekly applications of B-Nine up to the time of breaking color will delay the flowering by 1 week. Once flower color is evident, B-Nine delay is minimal, but application will enhance foliage. In greenhouse-forced Summer crops, an application of B-Nine at 5,000 ppm can be applied 14 to 21 days after pinching to control the more vigorous varieties.

Bonzi drenches of 1 to 4 ppm can provide very effective growth control, but be sure to apply the correct volume to avoid stunting. Early-crop applications require fewer ppm than when applied later in the crop to get the same level of control. Bonzi can also be sprayed with rates ranging from 30 to 50 ppm. Florel can be used to promote branching, prevent premature budding and delay flowering. Best applied early in the crop cycle at a rate of 300 to 500 ppm. Effectiveness varies by variety.

Spacing Requirements for Garden Mums		
Approximate Container Size	Plants per Pot (ppp)	Final Spacing (on center)
Cell pack	1	Pack to pack
4-in. (10-cm) pot	1	4 to 6 in. (10 to 15 cm)
4.5-in. (11-cm) pot	1	5 to 7 in. (13 to 18 cm)
5-in. (13-cm) pot	1 to 3	5 to 8 in. (13 to 20 cm)
6-in. (15-cm) pot	1 to 3	6 to 12 in. (15 to 30 cm)
6.5-in. (17-cm) pot	1 to 3	6.5 to 12 in. (17 to 30 cm)
8-in. (20-cm) pot	1 to 3	16 to 20 in. (41 to 51 cm)
10-in. (25-cm) pot	1 to 3	18 to 24 in. (46 to 61 cm)
12-in. (30-cm) pot	3 to 4	22 to 26 in. (56 to 66 cm)
14-in. (36-cm) pot	4 to 5	26 to 30 in. (66 to 76 cm)
1/2 bu. basket	4 to 5	28 to 34 in. (71 to 86 cm)
1 gallon	1 to 3	9 to 16 in. (23 to 41 cm)
2 gallon	1 to 3	18 to 24 in. (46 to 61 cm)
3 gallon	2 to 3	20 to 30 in. (51 to 76 cm)
5-in. (13-cm) pan	1 to 3	6 to 8 in. (15 to 20 cm)
8 x 5-in. (20 x 13-cm) mum pan	1 to 3	16 to 20 in. (41 to 51 cm)
12-in. (30-cm) color bowl	3 to 5	14 to 20 in. (36 to 51 cm)
14-in. (36-cm) color bowl	3 to 5	28 to 30 in. (71 to 76 cm)
6-in. (15-cm) hanging basket	1 to 3	14 to 16 in. (36 to 41 cm)
10-in. (25-cm) hanging basket	1 to 3	18 to 24 in. (46 to 61 cm)
12-in. (30-cm) hanging basket	2 to 4	26 to 28 in. (66 to 71 cm)

Heat Delay

The average daily temperature dictates the rate of development of a crop. High night temperatures may cause heat delay, with some varieties being more sensitive than others. Heat delay can affect the bloom date by up to 3 weeks.

Night temperatures in the July 20 to August 5 period are the most critical for natural-season mums.

Suggestions to avoid heat delay for black cloth crops:

- Start cooling very early in the morning.
- Cool at night with a pad and fan system that pulls air under the black cloth.
- When covering directly on or slightly above the plants, use black/white (Panda) film so the white side reflects the sunlight – reducing the plant temperature.
- Close the black cloth late in the day at 8:00 p.m. to avoid heat buildup and leave the cloth closed until 8:00 a.m.
- For enhanced cooling, a computerized black cloth system may be programmed to open after the sun has set and close before the sun comes up in the morning.
- Cover before sunrise instead of in the evening.

Root Rot

The loss of roots early in the crop will significantly limit nutrient loading and plant size later in the crop cycle. Saturated soil, extreme wet-dry cycles and high salt levels will damage the roots and make them more susceptible to disease infection.

Preventative treatment for Pythium and other root diseases is recommended every 4 weeks. Failure to control root rot can result in stunted plants.

Pests & Diseases

An IPM (Integrated Pest Management) program is the best defense against the various insects and related pests that can attack a mum crop. Constant monitoring and weekly scouting will enable the grower to detect pests before they become a problem, and take appropriate action to control them. Growers should also scout for foliar diseases, including Bacterial leaf spot and Botrytis.

Chrysanthemum white rust (CWR) is a serious disease, and preventative treatments should be applied. Review the CWR control document available on BallSeed.com.

Natural-Season Fall Mums

Chrysanthemums are short-day plants and will naturally initiate flowering in mid-July. Ball Garden Mums are classified into Very Early, Early, Mid, Late and Very Late flowering varieties. Refer to the A-Z Quick Reference Guide to determine the approximate flowering date for each variety.

Natural-Season Flowering	Average Natural-Flower Date
Very Early	Before Sept. 9
Early	Sept. 10 to 18
Mid	Sept. 19 to 26
Late	Sept. 27 to Oct. 4
Very Late	Oct. 5+

To produce a uniform crop, these flowering classes should be planted over a 2 to 3-week period. Plant the Very Early and Early varieties the first week of the planting period, then over the following weeks plant the Mid varieties, followed by the Late and Very Late varieties.

If all varieties were to be planted in the same week, then the crop time may be too long for the Mid and especially later varieties, which could then outgrow their spacing and produce poor-quality plants.

It is important to keep good records from year to year. This helps to adjust production schedules to produce consistent plant sizes, all flowering at the desired time. One cutting per pot is generally used for up to 9-in. (23-cm) pots, and 3 plants per pot for 12-in. (30-cm) pots.

The traditional Fall planting dates for natural-season crops planted from rooted cuttings:

- 4-in. (10-cm) pots in mid-July.
- 6-in. (15-cm) pots in early July.
- 8-in. (20-cm) or larger pots between the first and fourth weeks of June.

If pinching, pinch once the plant is established.

Refer to the Spacing Requirements chart for spacing required by pot size.

Fast-Crop Fall Mums

A “fast-crop” program can enable growers to produce a quality crop, even when starting later than a normal natural-season program.

The key to a fast crop is to not inhibit the growth by stressing the plant in any way. Do not pinch. Flowering will generally occur 4 to 7 days later than a June-planted crop.

A 4-in. (10-cm) crop with 1 cutting per pot can be planted from the last week of July until August 12 for flowering from late September to mid-October.

A 6 to 6.5-in. (15 to 17-cm) crop with 1 cutting per pot can be planted mid-July to late July.

Larger containers, such as 8-in. (20-cm) pans or 2-gal. pots, can be planted July 10 to 20, but use 2 cuttings per container.

Black Cloth



These outdoor-produced black cloth Garden Mums are being forced to flower for August sales at Adam Henning Greenhouses in DeMotte, IN.

Controlled Flowering of Summer-Fall Garden Mums

- Growing Garden Mums using black cloth to shorten the daylength is not difficult, and it enables the grower to flower Garden Mums over a longer season and have the crop ready when desired.
- After transplanting, plants should be grown under long days with night temps of 65 to 68°F (18 to 20°C) to encourage vigorous vegetative growth before beginning shade.
 - The number of weeks to achieve desired plant size depends upon pot size (2 to 4 weeks for 6"; 4+ weeks for 8" – see below chart).
 - Plants can be pinched about 7 days after planting once they have approximately 1 in. (3 cm) of new growth.
 - Many growers use a no-pinch option to produce their crops.
- The number of weeks of shade time needed depends upon the response time of the mum.
 - If it has a 7-week response, plants will flower 7 weeks after shading and will be ready for sale.
 - Black cloth, or 4 to 6 ml of reflective plastic, can be used to shade the crop. Place shade cloth 2+ feet above plants to avoid heat delay.
 - Continue to pull black cloth until the buds are well formed and show color.
 - To reduce heat build-up over 78°F (26°C), which can delay flowering, use reflective shade cloth and pull shade from 7:00 p.m. to 7:00 a.m.

These are suggestions, production should be adjusted for local growing conditions and treatments.

Schedule With Pinch, Medium Vigor			Plant	Long Days	Short Days		
Pot Size	PPP	For Sales (Crop Time)	Rooted Liner	Pinch	Start Shade	Response Group	Sell Date
6-6.5"	1	Weeks 24-36 (9 Weeks)	Weeks 15-27	7 Days After Planting	14 Days From Pinch Date	6 Week	6 Weeks From Shade Date
6-6.5"	1	Weeks 25-37 (10 Weeks)	Weeks 15-27	7 Days After Planting	14 Days From Pinch Date	7 Week	7 Weeks From Shade Date
6-6.5"	1	Weeks 26-38 (11 Weeks)	Weeks 15-27	7 Days After Planting	14 Days From Pinch Date	8 Week	8 Weeks From Shade Date

For 4-in. pot/1-PPP programs, adjust the plant and pinch date by 1 week.

For 8-in. pot/2-PPP programs, adjust the plant and pinch date by 1-2 weeks earlier.

Schedule With No Pinch, 7-Week Response, Medium Vigor			Plant	Long Day Weeks	Short Days	Approximate Finished Plant Size	
Pot Size	PPP	Crop Time - Weeks*	URC or Liner	After Potting	Start Shade	Width	Height
4"	1	9	Plant Liner	2	2 Weeks After Planting	6 in. (15 cm)	5 in. (13 cm)
4" Direct Stick	1	10	Direct Stick in Pots	3	3 Weeks After Sticking	6 in. (15 cm)	5 in. (13 cm)
6"	1	10	Plant Liner	3	3 Weeks After Planting	11-12 in. (28-30 cm)	6-7 in. (15-18 cm)
6" Direct Stick	1	13	Direct Stick in Pots	6	6 Weeks After Sticking	11-12 in. (28-30 cm)	6-7 in. (15-18 cm)
8"	1	12	Plant Liner	5	5 Weeks After Planting	13-14 in. (33-36 cm)	8-9 in. (20-23 cm)
10"	3	13	Plant Liner	6	6 Weeks After Planting	18-19 in. (46-48 cm)	11-12 in. (28-30 cm)
10"	1	16	Plant Liner	9	9 Weeks After Planting	18-19 in. (46-48 cm)	11-12 in. (28-30 cm)
12"	3	16	Plant Liner	9	9 Weeks After Planting	19-23 in. (48-58 cm)	13-14 in. (33-36 cm)

Add 1 week to crop time for 8-week response varieties; reduce by 1 week for 6-week response varieties.

2022 Black Cloth Programs Selection Grid

Color	6-Week Response	Vigor	Pot Size	HB*	7-Week Response	Vigor	Pot Size	HB*	8-Week Response	Vigor	Pot Size	HB*	9-Week Response	Vigor	Pot Size	HB*	
Bronze	Autumn Envy Bronze	Short	6-10"		Autumn Glow Bronze	Medium	4-12"	•									
					Butternut Golden Bronze	Medium/Tall	6-12"										
	Katelli Bronze	Short	4-8"	•	Copper Coin Bronze	Medium	4-8"	•									
					Harvest Bronze	Short	4-8"	•									
					Hot Spot Bronze	Medium	4-10"										
					Paradiso Bronze	Medium/Short	4-8"	•									
Orange					Blazing Orange	Medium	4-12"	•	Avalon Orange	Medium/Short	4-10"	•					
					Carousel Glimmer Orange	Medium	4-10"		Morgana Orange	Medium	4-12"						
					Kickin' Spicy Orange	Medium/Tall	6-12"		Pop Eye Orange	Medium	4-8"						
					Mumosa Orange	Medium	6-12"		Zuma Orange	Medium	6-10"						
					Perfectly Orange	Short	4-6"	•									
					Petit Orange	Medium	4-12"	•									
					Pumpkin Pie Orange	Medium	4-12"										
Yellow	Goldmine Yellow	Medium/Tall	6-12"	•	Cracklin Golden Yellow	Medium/Short	4-6"		Avalon Golden Yellow	Medium/Short	4-10"	•	Skyfall Lemon Yellow	Short	4-12"	•	
	Katelli Yellow	Medium	4-8"	•	Destiny Yellow	Medium	4-10"		Avalon Sunny Yellow	Medium	4-10"	•	Skyfall Yellow	Short	4-12"	•	
					Dove Yellow	Medium	4-10"		Gold Riot Yellow	Medium	4-10"	•					
					Gold Cup Yellow	Short	4-8"	•	Kizzmet Golden Yellow	Medium	4-12"	•					
					Gold Rush Yellow	Medium	6-12"		Morgana Yellow	Medium/Short	4-12"						
					Goldcrest Yellow	Medium	4-12"	•	Sundance Yellow	Medium	4-10"	•					
					Moonglow Yellow	Medium	4-10"	•	Sweet Honey Yellow	Medium	4-12"						
					Paradiso Yellow	Medium/Short	4-8"	•	Zinger Yellow	Medium	6-10"						
					Stellar Yellow	Medium	4-10"	•									
					Sunny Day Yellow	Medium	4-10"	•									
Green					Key Lime	Medium/Tall	4-8"	•									
	Red	Five Alarm Red	Medium	4-12"		Cranbury Red	Medium	6-12"		Avalon Red	Medium/Short	4-10"	•	Skyfall Red	Short	4-12"	•
						Majesty Red	Medium	4-12"	•	Eternal Red	Medium/Short	4-6"					
						Radiant Red	Medium/Tall	6-12"		Grapeberry Red	Medium	4-8"	•				
						Red Hots	Medium	4-10"	•	Morgana Red	Medium	4-12"					
						Red Rover	Medium	4-8"	•	Mumma Mia Red	Medium/Tall	6-10"					
					Stellar Red	Short	4-10"	•	Red Ryder	Medium	6-10"	•					
Purple	Amphion Lavender Purple	Medium	4-12"	•	Grapeberry Neon Purple	Medium	4-8"	•	Avalon Purple	Medium/Short	4-10"	•	Skyfall Purple	Short	4-12"	•	
					Grapeberry Purple	Medium	4-8"	•	Gypsy Rose Purple	Medium	4-12"	•					
					Majesty Purple	Medium	4-12"	•	Morgana Purple	Medium/Short	4-12"						
					Paintbox Purple	Medium/Short	4-10"		Prism Purple	Medium	4-12"	•					
					Plumberry Purple	Medium	4-12"										
					Poppin Purple	Medium	6-12"										
					Stellar Purple	Medium	4-10"	•									
					Venus Purple	Medium	4-12"	•									
Pink	Misty Lilac Pink	Medium	4-12"		Carousel Pink	Medium	4-10"		Avalon Pink	Medium/Short	4-10"	•	Skyfall Pink	Short	4-12"	•	
					Paradiso Pink	Medium/Short	4-8"	•	Morgana Pink	Medium	4-12"						
					Perfectly Pink	Medium/Short	4-6"	•	Pop Eye Pink	Medium	4-8"						
					Pink Frenzy	Medium/Tall	6-12"										
					Stellar Pink	Medium	4-10"	•									
					Temptation Pink	Medium	6-12"										
White	Aspen White	Medium	4-8"	•	Alpine White	Medium	4-8"		Avalon Crème White	Medium	4-10"	•	Skyfall White	Short	4-12"	•	
	Bridal White	Medium/Tall	4-12"		Carousel White	Medium	4-10"		Butter N' Cream White	Medium	4-12"	•					
	Celestial White	Medium	4-10"	•	Moonglow White	Medium	4-10"	•	Dove White	Medium	4-10"	•					
					Paradiso White	Medium/Short	4-8"	•	Morgana White	Medium/Short	4-12"						
					Starburst White	Medium/Short	4-8"	•									
Salmon				Carousel Blushing Salmon	Medium	4-10"		Avalon Salmon	Medium/Short	4-10"	•						

*Hanging Baskets • suggested

Propagation of Garden Mums

Upon Arrival

Stick immediately upon receipt for best results.

If necessary to hold cuttings, open the boxes and inspect.

Cuttings can be held at 34 to 38°F (1 to 3°C) for no more than 2 to 3 days. Leave the cuttings in the plastic wrap to prevent dehydration. If cuttings are wilted, increase the humidity in the cooler to <85%.

Media

Use soilless media that is well-drained with good aeration and moisture retention.

Maintain soil pH of 5.8 to 6.2 with an EC of less than 1.0 (mmhos/cm, SME).

Stick into moist media (4 on a 1-5 scale) and water-in so the soil is in contact with the stem.

Maintain media temperature between 70 to 74°F (21 to 23°C) using bottom heat.

50 to 100-count trays are most common.

Rooting Hormone

If desired, spray 100 to 200 ppm KIBA on cuttings the morning after stick, or do a pre-stick basal dip of 1,000 to 1,500 ppm IBA.

When spraying with KIBA, it is important to apply enough volume to run down the stem. Treat in both directions to ensure uniform application on all sides of the cutting.

Recommended for slow or harder-to-root varieties.

Misting

During the first 24 hours after sticking, it is critical to apply enough mist to rehydrate the cuttings, so the leaves are no longer limp.

After the first 24 hours, use the minimum mist that will prevent wilting. Start reducing mist once callus starts to form.

Apply only enough mist to wet the foliage and slightly increase soil moisture. Saturated soil will slow rooting due to excess callus formation.

Misting schedules should be adjusted to respond to current conditions, including light, temperature, humidity and degree of rooting. Reduce mist as soon as possible, beginning with a reduction during the night and pre-dawn period. By Day 4, night mist should not be needed to maintain turgid cuttings. Discontinue mist after 10 to 14 days, when roots reach the edge to bottom of container.

- If using a mist timer, adjust the frequency and duration to apply the minimum amount without wilting: Days 1 to 4, use 5 seconds of mist every 10 to 15 minutes.
- Days 5 to 8, use 5 seconds of mist every 15 to 20 minutes.
- Days 9 to 14, use 5 seconds of mist every 25 to 30 minutes.
- If using a VPD system, use a low value for the first day to rehydrate the cutting. Then increase gradually for the next 6 days, with a rapidly increasing value for the next 7 days. The pivot to the rapid increase is when the root initials begin to form ("root-horns").

Air Temperature

70 to 80°F (21 to 27°C) is important to prevent flower initiation during rooting, and it enhances rooting.

Light Levels

Reduce the light intensity to 1,500 to 2,500 foot-candles during the first 2 days, to help rehydrate the cuttings during hot, high-light periods.

Maintain 3,500 to 4,000 foot-candles once roots begin to form. High-light intensity will produce high-quality liners.

Photoperiod Control

Night-interruption lighting is recommended year-round at 10 foot-candles (100 lux), 10:00 p.m. to 2:00 a.m., to keep the cuttings vegetative and reduce premature budding.

Fertilizer

During rooting, feed 2 to 3 times a week, 1 to 3 days after stick (at 200 to 250 ppm N) or use a constant liquid feed of 100 ppm N.

Monitor the pH and EC to maintain in the appropriate range for good growth.

Plant Growth Regulators

B-Nine can be applied at 1,000 to 2,500 ppm. Apply first application on Day 7 after stick to reduce stretch; an additional application may be made on Day 14.

Florel can be applied at 350 to 500 ppm during propagation at Day 10 and 17. Results vary and may help prevent premature budding.

Bonzi is not recommended during propagation.

After the Cutting Is Rooted

Rooting liners can be transitioned to the finished growing-on environment.

Maintain warm night temperatures (>68°F/20°C) and long days up until April 15, when days are naturally long. Avoid low temperatures (<55°F/13°C), as this can trigger premature flowering.

Any stress at this time will reduce quality and may cause premature budding. Do not let liners wilt or soil remain saturated, as this can increase disease infection. Do not allow the liners to become rootbound and transplant as soon as appropriate. If left in the trays too long, the liners can become hard and may not take off uniformly when planted.

Fertilize the liners prior to planting with 300 to 400 ppm from 20-10-20 to ensure strong growth after transplant.

Water-in immediately after transplanting with fertilizer at 300 to 400 ppm N.

Disease Management

Refer to online pesticide recommendations for appropriate chemicals for use in your location.

Chrysanthemum white rust (CWR) is a major disease that you should treat proactively to prevent infection. Refer to the CWR Grower Facts on [BallSeed.com](https://www.ballseed.com) for detailed information.

Botrytis is a serious problem when excess humidity is present. Application of Pageant fungicide within 3 days of sticking provides excellent disease control and promotes more uniform rooting.

Application of a pre-transplant soil drench to the liners to manage Pythium and other soil-borne diseases will enhance rapid establishment in the final container.

Insect Management

Refer to online pesticide recommendations for appropriate chemicals for use in your location.

Mites have become a significant pest in the last several years. Monitor the plants in the propagation area, as this may be a source for mites to move onto the mum liners.

Leafminers are a common pest of mums. Begin your monitoring and spray program for adults and larvae as soon as misting stops.

Fungus gnats and Shore fly larvae can cause significant root damage if populations are allowed to become established. Start with clean floors and apply bio-controls after sticking to keep populations under control.

Aphids can become a spontaneous problem in the Summer months, when large populations suddenly appear on the crop. Regular monitoring is critical to stop infestations from spreading.

Whitefly and thrips can become problems late in the crop, but seldom are serious pests during propagation.

SPRING-FLOWERING PROGRAMS

Light/Shade Program

Refer to the chart below for specific requirements and typical 4-in. (10-cm) schedule.
 This program more accurately controls the size and flowering time than with a No Light/No Shade Program.
 It is essential to maintain a minimum night temperature of 65°F (18°C).
 For crops flowering after May 1, shade or black cloth is required for controlled flowering response.

Light/Shade Spring-Flowering Program for 7-Week Response Garden Mums

Long Days

Pot Size	PPP	Crop Time	Plant Rooted Liner*	Pinch**	Light from 10:00pm to 2:00am	Shade	Sale***
4-4.5"	1	9 Weeks	Weeks 2 to 10	1 Week After Planting	Day 0 to 14 After Planting	No	Weeks 11 to 19
4-4.5"	1	9 Weeks	Weeks 11 to 14	1 Week After Planting	Day 0 to 14 After Planting	Start Shade Day 15	Weeks 20 to 23

*5-6.5" containers should be planted, grown under long days, and pinched 1 week earlier.

**Pinch plants when roots hit side of pot and have approximately 1 in. (3 cm) of new shoot growth.

***6-week varieties will have an 8-week crop time; 8-week varieties will have a 10-week crop time.

These are suggestions, production should be adjusted for local growing conditions and treatments.

Ball Mums Rooting Stations

Your Ball Seed Sales Rep works with the most reliable suppliers in North America to provide you with the highest-quality rooted mum cuttings.

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Loudon, New Hampshire

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