



Perennial
at-a-Glance Guide

syngenta *flowers*

Seed Perennials Guidelines and Schedules

ASSORTMENT			PROPAGATION GUIDELINES							VERNALIZATION		
Species / Series	Hardiness (USDA Zone)	Blooming Season	Plug Size	Seeds/ Plug	Seed Cover	Germ. Temp (Stage 1)	Stage 2-3 Temp	Plug Time (wks)	Comments	Vernalization Requirement	Duration (wks) & Temperature (ADT)	Comments
<i>Anemone hupehensis</i> Pink Saucer™	4-8	Fall	288	3	Light Vermiculite	60-65° F (16-19° C)	60-65° F (16-18° C)	10-12		First-year Flowering	N/A	No vernalization needed. Plants flower naturally in late summer to early fall.
<i>Aquilegia caerulea</i> Origami™	4-9	Spring	288	2	Light Vermiculite	65-70° F (19-21° C)	64-68° F (18-20° C)	9-10		Cold Required	3-4 50-55° F (10-12° C)	Short vernalization period required for more uniform flowering.
<i>Arabis blepharophylla</i> Rose Delight™	3-7	Early Spring	288	3-4	Light Vermiculite	68-72° F (20-22° C)	60-65° F (16-18° C)	7-8		Cold Required	5-8 40-50° F (5-10° C)	Bulk plants for 5-6 weeks 1 QT and 6-7 weeks 1 GAL prior to vernalization.
<i>Arabis caucasica</i> Little Treasure™	3-7	Early Spring	288	3-4	No Cover	65-70° F (18-21° C)	60-65° F (16-18° C)	6-7		Cold Required	5-8 40-50° F (5-10° C)	Bulk plants for 5-6 weeks 1 QT and 6-7 weeks 1 GAL prior to vernalization.
<i>Arenaria montana</i> Blizzard™	4-7	Early Spring	288	2-3	Light Vermiculite	64-68° F (18-20° C)	60-65° F (16-18° C)	5-6		Cold Required	8-10 40-50° F (5-10° C)	Bulk plants for 5-6 weeks 1 QT and 6-7 weeks 1 GAL prior to vernalization.
<i>Aubrieta hybrida</i> Audrey™	4-7	Early Spring	288	2-3	Light Vermiculite	64-68° F (18-20° C)	60-65° F (16-18° C)	5-6	B-Nine® (S) 1500-2500 ppm or Cycocel® (S) 500-750 ppm if needed to tone plugs.	Cold Required	6-10 40-50° F (5-10° C)	Bulk plants for 5-6 weeks 1 QT and 6-7 weeks 1 GAL prior to vernalization.
<i>Aurinia saxatilis</i> Summit™	3-8	Early Spring	288	3-4	No Cover	65-72° F (18-22° C)	64-68° F (18-20° C)	6-7		Cold Required	5-8 40-50° F (5-10° C)	Bulk plants for 5-6 weeks 1 QT and 6-7 weeks 1 GAL prior to vernalization.
<i>Campanula cochlearifolia</i> Swinging Bells™	6-9	Summer	288	3-4	No Cover	65-72° F (18-22° C)	64-68° F (18-20° C)	8-9	Grow plugs under short day conditions (<12 hours).	First-year Flowering	N/A	No vernalization needed. Plants flower naturally in the summer season.
<i>Campanula garganica</i> Filligree™ Imp.	5-9	Summer	288	2-4	No Cover	68-72° F (20-22° C)	65-68° F (18-20° C)	8-9	Grow plugs under short day conditions (<12 hours).	Cold Beneficial	6-10 40-50° F (5-10° C)	Vernalized plants will flower earlier and more uniformly.
<i>Campanula glomerata</i> Bellefleur™	3-8	Summer	288	2-3	No Cover	68-72° F (20-22° C)	65-68° F (18-20° C)	8-9	Grow plugs under short day conditions (<12 hours); sow into a high pH plug media (6.4-6.8).	Cold Beneficial	6-10 40-50° F (5-10° C)	Vernalization reduces the time to flower by 2-3 weeks.
<i>Campanula portenschlagiana</i> Clockwise™	3-7	Summer	288	3	No Cover	68-72° F (20-22° C)	65-68° F (18-20° C)	9-10	Grow plugs under short day conditions (<12 hours).	First-year Flowering	N/A	No vernalization needed. Plants flower naturally in long days.
<i>Campanula rapunculoides</i> Cambell™	3-9	Summer	288	3	No Cover	68-72° F (20-22° C)	65-68° F (18-20° C)	8-9	Grow plugs under short day conditions (<12 hours).	First-year Flowering	N/A	No vernalization needed. Plants flower naturally in long days.

ppp = plants per pot, N/A = not applicable, wks=weeks

FINISHING GUIDELINES AND SCHEDULES			CULTURAL GUIDELINES					
Suggested Pot Sizes : ppp : Finish Crop Time	Temperature (Day/Night)	Photoperiod (Day Length)	Media pH	Media EC (mS/cm) SME	Fertilizer Rate (ppm N)	Plant Growth Regulator (PGR) Spray (S) Drench (D)	Insects & Diseases	Comments
1 GAL : 1 ppp : 12–14 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Facultative Long Day	5.6–6.2	1.5–2.0	150–200 from calcium-based fertilizers	Bonzi® (D) 2 ppm	Thrips, Botrytis	Improved color stability and uniformity in flowering.
1 QT : 1–2 ppp : 9–11 wks 1 GAL : 3 ppp : 9–11 wks 2 GAL : 4–5 ppp : 9–11 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Facultative Long Day	5.6–6.2	1.5–2.0	150–200 from calcium-based fertilizers	B-Nine® (S) 2500 ppm, Bonzi® (S) 10–15 ppm	Spider Mites, Aphids, Botrytis, Pythium, Powdery Mildew	
1 QT : 1–2 ppp : 7–8 wks 1 GAL : 2–3 ppp : 7–8 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Facultative Long Day	5.5–6.5	1.25–1.75	50–75 or 150 as needed	B-Nine® (S) 2500 ppm	Aphids, Botrytis, Pythium, Rhizoctonia	Best used in small containers (4-inch to quarts) using 1 ppp.
1 QT : 1–2 ppp : 6–7 wks 1 GAL : 2–3 ppp : 6–7 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Day Neutral	5.5–6.5	1.25–1.75	50–75 or 150 as needed	B-Nine® (S) 2500 ppm	Aphids, Botrytis, Pythium, Rhizoctonia	Best used in small containers (4-inch to quarts) using 1 ppp.
1 QT : 1–2 ppp : 8–9 wks 1 GAL : 2–3 ppp : 8–9 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Obligate Long Day	5.5–6.2	1.0–1.5	50–75 or 150 as needed	B-Nine® (S) 2500 ppm	Aphids, Botrytis, Pythium, Rhizoctonia	Growing outdoors under cold conditions will increase crop times. Watch EC levels as roots are sensitive to high salt concentrations.
1 QT : 1–2 ppp : 14–18 wks 1 GAL : 2–3 ppp : 14–18 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Day Neutral	5.5–6.5	1.0–1.5	50–75 or 150 as needed	B-Nine® (S) 2500–3750 ppm, Cycocel® (S) 500–1000 ppm		If grown outside, cover plants to prevent losses at temperatures below freezing.
1 QT : 1–2 ppp : 5–6 wks 1 GAL : 3 ppp : 6–7 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Day Neutral	5.5–6.5	1.25–1.75	50–75 or 150 as needed	B-Nine® (S) 2500 ppm	Aphids, Downy Mildew	Best used in small containers (4-inch to quarts) using 1 ppp. Watch for Downy Mildew under high humidity and prolonged leaf wetness. Good plant for rock gardens and walls.
1 QT : 1 ppp : 10–12 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Obligate Long Day	5.6–6.2	1.5–2.0	150–200 from calcium-based fertilizers	B-Nine® (S) 2500–3750 ppm, Cycocel® (S) 500–1000 ppm	Aphids, Spider Mites, Whiteflies, Botrytis, Pythium	After transplanting, keep plants under short day conditions for 2–3 weeks, then provide daylengths of 13.5 hours or more to force flowering.
1 QT : 1 ppp : 10–12 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Obligate Long Day	5.6–6.2	1.5–2.0	150–200 from calcium-based fertilizers	B-Nine® (S) 2500–3750 ppm, Cycocel® (S) 500–1000 ppm	Aphids, Spider Mites, Whiteflies, Botrytis, Pythium	Grow indoors/outdoors with high light conditions, well drained soil and high nutrient levels. Botrytis may become a problem if grown under sub-optimal cultural conditions.
1 QT : 1 ppp : 10–12 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Obligate Long Day	6.0–6.4	1.25–1.75	50–75 or 150 as needed	B-Nine® (S) 2500 ppm, Bonzi® (S) 15 ppm, Sumagic® (S) 3–5 ppm as needed	Aphids, Spider Mites, Whiteflies, Botrytis, Pythium	Avoid overly wet growing conditions. Bellefleur can become soft and lodge under high feed and warm growing conditions—grow plants cool and under reduced feed to keep under control.
1 QT : 1–2 ppp : 9–10 wks 1 GAL : 3 ppp : 9–10 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Obligate Long Day	5.5–6.5	1.0–1.5	50–75 or 150 as needed	B-Nine® (S) 2500–3750 ppm, Cycocel® (S) 500–1000 ppm	Aphids, Spider Mites, Whiteflies, Botrytis, Pythium	After transplanting, keep plants under short day conditions for 2–3 weeks, then provide daylengths of 13.5 hours or more to force flowering.
1 QT : 1–2 ppp : 10–14 wks 1 GAL : 3 ppp : 10–14 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Obligate Long Day	5.5–6.5	1.0–1.5	50–75 or 150 as needed	B-Nine® (S) 2500 ppm, Bonzi® (S) 15 ppm, Sumagic® (S) 3–5 ppm as needed	Aphids, Spider Mites, Whiteflies, Botrytis, Pythium	

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Species / Series	Hardiness (USDA Zone)	Blooming Season	Plug Size	Seeds/ Plug	Seed Cover	Germ. Temp (Stage 1)	Stage 2-3 Temp	Plug Time (wks)	Comments	Vernalization Requirement	Duration (wks) & Temperature (ADT)	Comments
<i>Coreopsis grandiflora</i> Andiamo™	5-9	Spring	288	3	Light Vermiculite	65-72° F (18-22° C)	65-68° F (18-20° C)	6-8	B-Nine® (S) 2500 ppm or Bonzi® (S) 5 ppm if needed to tone plugs.	First-year Flowering	N/A	First-year flowering perennial. No vernalization needed.
<i>Delphinium elatum</i> Excalibur™	4-8	Late Spring	72, 128	2-3	Light Vermiculite	65-72° F (18-22° C)	64-68° F (18-20° C)	7-8	B-Nine® (S) 2500 ppm or Bonzi® (S) 5 ppm if needed to tone plugs.	First-year Flowering	N/A	No vernalization needed.
<i>Delphinium grandiflorum</i> Delfix®	5-9	Summer	288	3	Light Vermiculite	65-72° F (18-22° C)	64-68° F (18-20° C)	7-8	B-Nine® (S) 2500 ppm or Bonzi® (S) 5 ppm if needed to tone plugs.	First-year Flowering	N/A	No vernalization needed.
<i>Dianthus barbatus</i> Barbarini® F1	4-9	Spring	288	3	Light Vermiculite	65-72° F (19-22° C)	62-65° F (17-19° C)	6-7	B-Nine® (S) 2500 ppm or Bonzi® (S) 5 ppm if needed to tone plugs; provide 14 hours or more supplemental lighting in plug stages.	First-year Flowering	N/A	No vernalization required. Can be transplanted in late summer to early fall for early spring sales.
<i>Digitalis purpurea</i> Camelot™	4-9	Late Spring	72, 128	2-3	No Cover/ Light Vermiculite	65-70° F (19-21° C)	64-68° F (18-20° C)	6-7	B-Nine® (S) 2500 ppm or Bonzi® (S) 5 ppm if needed to tone plugs.	First-year Flowering	N/A	No vernalization required. Can be transplanted in late summer to early fall for faster flowering.
<i>Doronicum orientale</i> Leonardo™	4-7	Early Spring	288	3	Light Vermiculite	68-72° F (20-22° C)	64-68° F (18-20° C)	7-8		Cold Required	6-10 35-45° F (2-7° C)	Bulk plants for 5-6 weeks 1 QT and 6-7 weeks 1 GAL prior to vernalization.
<i>Echinacea purpurea</i> Prairie Splendor™	3-9	Late Spring	288	2-4	Heavy Vermiculite	70-75° F (21-24° C)	62-65° F (17-19° C)	6-7	Grow plugs under short day conditions (<12 hours).	Cold Beneficial	6-10 40-50° F (5-10° C)	First-year flowering perennial. Will flower earlier and produce more branches if vernalized.
<i>Erysimum hybridum</i> Canaries™	4-8	Early Spring	288	1-2	No Cover	68-72° F (20-22° C)	65-70° F (19-21° C)	6-7	Provide 14 hours or more supplemental lighting in plug stages if no vernalization period is provided.	Cold Beneficial	6-10 40-50° F (5-10° C)	Vernalize for early spring sales. Provide long days for flowering if not vernalizing.
<i>Heuchera americana</i> Marvelous Marble™	3-9	Spring	128, 288	4-5	No Cover/ Light Cover	65-72° F (19-22° C)	64-68° F (18-20° C)	9-10		Not Required (Sold for foliage)	N/A	Can transplant in late summer to early fall to bulk in the final container size.
<i>Heuchera sanguinea</i> Coral Forest™	3-9	Spring	128, 288	4-5	No Cover/ Light Vermiculite	65-72° F (19-22° C)	64-68° F (18-20° C)	9-10		Cold Required	6-10 40-50° F (5-10° C)	Bulk plants for 4 to 5 weeks 1 QT and 6-7 weeks 1 GAL prior to vernalization.
<i>Iberis sempervirens</i> Tahoe™	3-9	Early Spring	288	3-4	Light Vermiculite	60-65° F (16-19° C)	60-65° F (16-19° C)	7-8		Cold Required	8-10 35-45° F (2-7° C)	Bulk plants for 7 to 8 weeks 1 QT and 8-10 weeks 1 GAL prior to vernalization.
<i>Lavandula angustifolia</i> Scent™	5-9	Summer	288	2-3	Light Vermiculite	65-72° F (19-22° C)	65-72° F (19-22° C)	9-10	Grow plugs at less than 13.5 hours of daylength.	First-year Flowering	N/A	No vernalization needed.

ppp = plants per pot, N/A = not applicable, wks=weeks

FINISHING GUIDELINES AND SCHEDULES			CULTURAL GUIDELINES					
Suggested Pot Sizes : ppp : Finish Crop Time	Temperature (Day/Night)	Photoperiod (Day Length)	Media pH	Media EC (mS/cm) SME	Fertilizer Rate (ppm N)	Plant Growth Regulator (PGR) Spray (S) Drench (D)	Insects & Diseases	Comments
1 QT : 1 ppp : 7–8 wks 1 GAL : 2–3 ppp : 8–9 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Obligate Long Day	5.8–6.5	1.5–2.0	75–100 or 200 as needed	B-Nine® (S) 2500 ppm, Bonzi® (S) 15 ppm, Sumagic® (S) 3–5 ppm as needed	Aphids, Spider Mites, Whiteflies, Botrytis, Pythium	
1 GAL : 1 ppp : 9–10 wks 2 GAL : 2–3 ppp : 9–10 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Facultative Long Day	6.0–6.5	1.5–2.0	75–100 or 200 as needed	Bonzi® (S) 10–15 ppm, Sumagic® (S) 5–10 ppm, Bonzi® (D) 2–4 ppm at visible bud	Aphids, Whiteflies, Pythium, Fungal Leaf Spot	Best in gallons and larger containers. Keep feed levels up throughout production.
1 QT : 1–2 ppp : 9–10 wks 1 GAL : 3 ppp : 9–10 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Facultative Long Day	6.0–6.5	1.5–2.0	75–100 or 200 as needed	Bonzi® (S) 15 ppm. Apply 1 or 2 applications 10–14 days apart.	Aphids, Whiteflies, Pythium	Good plant for small containers (4-inch to quarts) using 1 ppp. Very uniform to flower. Keep feed levels up throughout production.
1 QT : 1–2 ppp : 8–9 wks 1 GAL : 3 ppp : 8–9 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Day Neutral	5.5–6.2	1.0–1.5	50–75 or 150 as needed	Bonzi® (S) 10–15 ppm, Sumagic® (S) 3–5 ppm	Aphid, Thrips, Whiteflies, Botrytis, Pythium	Transplant in late summer to early fall for following early spring sales. Transplant in early spring for summer flowering.
1 GAL : 1 ppp : 9–10 wks 2 GAL : 2–3 ppp : 9–10 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Obligate Long Day	5.8–6.2	1.25–1.5	75–125 with each irrigation	Bonzi® (S) 10–15 ppm or Sumagic® (S) 5 ppm. Apply just as the flower spike begins to elongate.	Aphids, Botrytis	Large plants that are best grown in gallon or larger containers. Will use a significant amount of water when mature.
1 QT : 1 ppp : 7–8 wks 1 GAL : 1–2 ppp : 8–9 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Day Neutral	5.5–6.2	1.5–2.0	75–100 or 150–200 as needed	Compact variety typically does not require pgr	Aphids, Botrytis, Powdery Mildew, Pythium	
1 QT : 1–2 ppp : 10–12 wks 1 GAL : 3 ppp : 10–12 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Obligate Long Day	5.8–6.5	1.5–2.0	75–100 or 150–200 as needed	Bonzi® (S) 15 ppm using multiple applications or Bonzi® (D) 2–3 ppm at visible bud	Aphids, Whiteflies, Fusarium, Fungal Leaf Spot	Start plants under short day conditions to allow for bulking prior to flowering at 14 hours or more.
1 QT : 1–2 ppp : 9–10 wks 1 GAL : 3 ppp : 9–10 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Day Neutral	5.8–6.2	1.5–2.0	75–100 or 150–200 as needed	Bonzi® (S) 15 ppm or B-Nine® (S) 2500 ppm + Cycocel® (S) 1000 ppm tank mix	Aphids, Botrytis, Powdery Mildew, Rhizoctonia, Rust	Vernalization period will produce more branched habit and earlier, more uniform flowering. If no vernalization is provided, 14 hours or more day length will be needed to initiate flowering.
1 QT : 1 ppp : 10–12 wks 1 GAL : 1–2 ppp : 12–14 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Day Neutral (Sold for Foliage)	5.8–6.2	1.25–1.75	50–75 or 150 as needed	Bonzi® (S) 15 ppm only if necessary	Aphids, Whiteflies, Pythium, Rhizoctonia	Interesting foliage color and pattern. In colder temperatures, foliage will be more purple, as temperatures increase leaves will show silver marble pattern.
1 QT : 1 ppp : 9–10 wks 1 GAL : 1–2 ppp : 9–10 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Facultative Long Day	5.8–6.2	1.25–1.75	50–75 or 150 as needed	Bonzi® (S) 15 ppm only if necessary	Aphids, Whiteflies, Pythium, Rhizoctonia	Does not tolerate overly wet or overly dry growing conditions.
1 QT : 1–2 ppp : 5–6 wks 1 GAL : 2–3 ppp : 5–6 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Day Neutral	5.5–6.2	1.25–1.75	50–75 or 150 as needed	Bonzi® (S) 15 ppm only if necessary	Botrytis, Powdery Mildew	Pinch at transplant in fall to ensure pot fill prior to vernalization period.
1 QT : 1–2 ppp : 8–9 wks 1 GAL : 2–3 ppp : 9–10 wks 2 GAL : 3–4 ppp : 10–11 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Facultative Long Day	5.8–6.2	1.25–1.75	50–75 or 150 as needed	B-Nine® (S) 2500 ppm, Bonzi® (S) 10–15 ppm	Aphids, Whiteflies, Phytophthora, Pythium, Fungal Leaf Spot	Pinch plants once established (approximately 10–14 days after transplanting) in final container for best plant fill and habit.

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<i>Lavandula stoechas</i> Castilliano™	7-9	Spring	288	2-3	Light Vermiculite	65-72° F (19-22° C)	65-72° F (19-22° C)	9-10	Bulking under short days required (<12 hours).	Cold Required	3-4 50-60° F (10-16° C)	Short vernalization period required for more uniform flowering.
<i>Papaver nudicaule</i> Pulchinella™, Spring Fever™	3-7	Early Spring	288	3	Light Vermiculite	64-68° F (19-20° C)	60-65° F (16-19° C)	6-7		Cold Beneficial	6-10 40-50° F (5-10° C)	Transplant in late summer to early fall. Bulk in the final container size.
<i>Penstemon hartwegii</i> Arabesque™	7-9	Summer	288	1	Light Vermiculite	68-72° F (20-22° C)	65-70° F (19-21° C)	5-6	Provide 14 hours or more supplemental lighting in plug stages.	First-year Flowering	N/A	No vernalization needed.
<i>Primula denticulata</i> Corolla™	5-8	Early Spring	288	2-3	Light Vermiculite	62-68° F (17-20° C)	64-68° F (18-20° C)	7-8		Cold Required	5-8 35-45° F (2-7° C)	Bulk plants for 4 to 5 weeks 1 QT and 6 to 7 weeks 1 GAL prior to vernalization.
<i>Primula rosea</i> Rosy™	5-8	Early Spring	288	2-3	Light Vermiculite	62-68° F (17-20° C)	64-68° F (18-20° C)	7-8		Cold Required	5-8 35-45° F (2-7° C)	Bulk plants for 4 to 5 weeks 1 QT and 6 to 7 weeks 1 GAL prior to vernalization.
<i>Primula veris</i> Cabrillo™	5-9	Early Spring	288	2-3	Light Vermiculite	62-68° F (17-20° C)	64-68° F (18-20° C)	7-8		Cold Required	5-8 35-45° F (2-7° C)	Bulk plants for 4 to 5 weeks 1 QT and 6 to 7 weeks 1 GAL prior to vernalization.
<i>Rudbeckia hirta</i> TigerEye™	6-9	Summer	288	1	Light Vermiculite	70-75° F (21-24° C)	68-72° F (20-22° C)	5-6	If needed, spray B-Nine® @ 2500-3750 ppm to tone prior to transplanting	First Year Flowering	N/A	No vernalization needed.
<i>Salvia x superba</i> Merleau®	4-8	Spring	288	2	No Cover	68-75° F (20-22° C)	65-70° F (18-21° C)	5-6		First-year Flowering	N/A	No vernalization needed. Will flower earlier in spring if vernalized.
<i>Saxifraga x arendsii</i> Highlander™	5-8	Early Spring	288	1-2	Vermiculite	68-72° F (20-22° C)	64-68° F (18-20° C)	9-10		Cold Required	9-12 35-45° F (2-7° C)	Bulk plants for 5-6 weeks 1 QT and 6 to 7 weeks 1 GAL prior to vernalization.
<i>Sedum nevii</i> Silver Frost™	6-9	Summer	288	4-5	No Cover	65-72° F (18-22° C)	65-70° F (18-21° C)	7-8		First-year Flowering	N/A	No vernalization needed.
<i>Sedum pulchellum</i> Sea Star™	6-9	Summer	288	4-5	No Cover	65-72° F (18-22° C)	65-70° F (18-21° C)	7-8		First-year Flowering	N/A	No vernalization needed.
<i>Sedum spurium</i> Solarity™	4-9	Summer	288	3-4	No Cover	65-72° F (18-22° C)	65-70° F (18-21° C)	7-8		First-year Flowering	N/A	No vernalization needed.
<i>Sedum telephium</i> Surrender™	4-9	Fall	288	3-4	No Cover	65-72° F (18-22° C)	65-70° F (18-21° C)	7-8		First-year Flowering	N/A	No vernalization needed.

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FINISHING GUIDELINES AND SCHEDULES			CULTURAL GUIDELINES					
Suggested Pot Sizes : ppp : Finish Crop Time	Temperature (Day/Night)	Photoperiod (Day Length)	Media pH	Media EC (mS/cm) SME	Fertilizer Rate (ppm N)	Plant Growth Regulator (PGR) Spray (S) Drench (D)	Insects & Diseases	Comments
1 QT : 1–2 ppp : 8–9 wks 1 GAL : 2–3 ppp : 9–10 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Facultative Long Day	5.8–6.2	1.25–1.75	50–75 or 150 as needed	B-Nine® (S) 2500 ppm, Bonzi® (S) 10–15 ppm	Aphids, Whiteflies, Phytophthora, Pythium, Fungal Leaf Spot	Pinch plants once established (approximately 10–14 days after transplanting) in final container for best plant fill and habit.
1 QT : 1–2 ppp : 6–7 wks 1 GAL : 3 ppp : 6–7 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Day Neutral	5.5–5.9	1.25–1.75	50–75 or 150 as needed	Not necessary	Aphids, Thrips, Spider Mites, Bacterial Blight, Phytophthora, Powdery Mildew, Rhizoctonia	Growing under high light and cool growing temperatures improves overall quality. Keep media pH less than 6.0 to prevent iron deficiency symptoms.
1 QT : 1 ppp : 11–13 wks 1 GAL : 1–2 ppp : 11–13 wks 2 GAL : 3 ppp : 11–13 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Facultative Long Day	5.8–6.2	1.25–1.75	50–75 or 150 as needed	Bonzi® (S) 15 ppm, Sumagic® (S) 10 ppm	Aphid, Thrips, Whiteflies, Botrytis, Pythium	Provide long days and 68° F (20° C) ADT for fastest flowering and finishing.
1 QT : 1–2 ppp : 6–7 wks 1 GAL : 2–3 ppp : 6–7 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Day Neutral	5.5–6.0	<1.2	75–100 as needed	B-Nine® (S) 2500 ppm or Sumagic® (S) 3 ppm as needed	Aphids, Whiteflies, Botrytis on flowers, Pythium, Rhizoctonia	Best used in small containers (4-inch to quarts) using 1 ppp. Sensitive to high salts.
1 QT : 1–2 ppp : 6–7 wks 1 GAL : 2–3 ppp : 6–7 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Day Neutral	5.5–6.0	<1.2	75–100 as needed	B-Nine® (S) 2500 ppm or Sumagic® (S) 3 ppm as needed	Aphids, Whiteflies, Botrytis on Flowers, Pythium, Rhizoctonia	Best used in small containers (4-inch to quarts) using 1 ppp. Sensitive to high salts.
1 QT : 1–2 ppp : 6–7 wks 1 GAL : 2–3 ppp : 6–7 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Day Neutral	5.5–6.0	<1.2	75–100 as needed	B-Nine® (S) 2500 ppm or Sumagic® (S) 3 ppm as needed	Aphids, Whitefly, Botrytis on Flowers, Pythium, Rhizoctonia	Best used in small containers (4-inch to quarts) using 1 ppp. Sensitive to high salts.
1 QT : 1–2 ppp : 9–10 wks 1 GAL : 2–3 ppp: 10–11 wks 2 GAL : 3–4 ppp : 11–13 wks	70–85° F (21–29° C)/ 65–70° F (18–21° C)	Obligate Long Day	5.8–6.2	1.25–1.75	150–200 from calcium-based fertilizers	B-Nine® (S) 2500–5000 ppm; Bonzi® (S) 5–10 ppm; Bonzi® (D) 0.5–1 ppm	Aphid, Thrips, Whiteflies, Botrytis, Pythium, Bacterial leaf spots	Provide long days and 70–74° F (21– 23° C) ADT for fastest flowering and finishing
1 QT : 1–2 ppp : 7–8 wks 1 GAL : 2–3 ppp : 7–8 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Facultative Long Day	5.6–6.2	1.5–2.0	75–100 or 150–200 as needed	B-Nine® (S) 2500 ppm	Aphids, Spider Mites, Whiteflies, Rhizoctonia	
1 QT : 1–2 ppp : 6–7 wks 1 GAL : 2–3 ppp : 6–7 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Day Neutral	5.8–6.4	1.25–1.75	50–75 or 150 as needed	Not necessary	Aphids, Botrytis, Powdery Mildew, Rust	Keep evenly moist and don't allow to dry out completely for uniform and consistent flowering. Although germination is about 65–70%, it is best seeded with 1–2 seeds per plug to maintain even developing plants. Too many seeds/plug results in uneven finished pots.
1QT :1–2ppp: 7–9 wks 1GAL: 2– 3 ppp: 7–9 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Obligate Long Day	6.0–6.5	1.5–2.0	75–100 or 150–200 as needed	Bonzi® (S) 5–15 ppm only if necessary	Aphids, Whiteflies, Powdery Mildew	Best used in small containers (4-inch to quarts) using 1 ppp.
1QT :1–2ppp: 7–9 wks 1GAL: 2– 3 ppp: 7–9 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Obligate Long Day	6.0–6.5	1.5–2.0	75–100 or 150–200 as needed	Bonzi® (S) 5–15 ppm only if necessary	Aphids, Whiteflies, Powdery Mildew	Best used in small containers (4-inch to quarts) using 1 ppp. Too high of temperatures will give an uneven flowering response.
1QT :1 ppp: 13–15 wks 1GAL: 2–3 ppp: 13–15 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Obligate Long Day	5.8–6.4	1.25–1.75	50–75 or 150 as needed	Bonzi® (S) 5–15 ppm only if necessary	Aphids, Whiteflies, Powdery Mildew	Can be shipped as a groundcover in spring and as a flowering perennial in mid to late summer.
1QT :1 ppp: 13–15 wks 1GAL: 2–3 ppp: 13–15 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Obligate Long Day	5.8–6.4	1.25–1.75	50–75 or 150 as needed	Bonzi® (S) 5–15 ppm only if necessary	Aphids, Whiteflies, Powdery Mildew	Good vigor for gallon production; very well branched—no pinch required.

Vegetative Perennials Guidelines and Schedules

ASSORTMENT				PROPAGATION GUIDELINES							VERNALIZATION		
Species / Series	Genetic Owner	Hardiness (USDA Zone)	Blooming Season	Plug Size	Rooting Temp.	Temps After Rooted	Rooting Hormone	Pinch in Prop	Rooting Time (wks)	Comments	Vernalization Requirement	Duration (wks) & Temperature (ADT)	Comments
<i>Achillea millifolium</i> Desert Eve™	Syngenta Flowers	5–9	Late Spring	102	70–72° F (21–22° C)	64–68° F (18–20° C)	No	No	5–6, 1 ppp	Once roots are initiated, avoid excessive moisture on foliage.	Not Required		
<i>Ajuga reptans</i> Braunherz, Burgundy Glow	Generic	4–9	Spring	102	70–72° F (21–22° C)	64–68° F (18–20° C)	No	No	4–5, 1 ppp	Fall production required for spring flowers, spring production for foliage.	Cold Required	7–8 50° F (10° C)	Bulk plants for 4–5 weeks 1 QT and 6–7 weeks 1 GAL prior to vernalization.
<i>Arenaria montana</i> Summer White	Syngenta Flowers	5–9	Early Spring	102	68–70° F (20–21° C)	64–68° F (18–20° C)	Yes, 500–1000 ppp Quick Dip	Yes	5–6, 1 ppp	Pinch 7–10 days prior to transplant leaving 4–6 leaf nodes.	Cold Required	5–6 50° F (10° C)	Bulk plants for 5–6 weeks 1 QT and 6–7 weeks 1 GAL prior to vernalization.
<i>Aubrieta hybrid</i> Axcen™	Syngenta Flowers	6–9	Early Spring	102	68–70° F (20–21° C)	64–68° F (18–20° C)	Yes, 500–1000 ppp Quick Dip	No	6–7, 1 ppp	Once roots are initiated, avoid excessive moisture on foliage.	Cold Required	7–8 50° F (10° C)	Bulk plants for 5–6 weeks 1 QT and 6–7 weeks 1 GAL prior to vernalization.
<i>Campanula interspecific</i> Beyond Blue	Syngenta Flowers	5–9	Late Spring	102	70–72° F (21–22° C)	64–68° F (18–20° C)	Yes, 500–1000 ppp Quick Dip	Yes	5–6, 1 ppp	Pinch 7–10 days prior to transplant leaving 4–6 leaf nodes.	Not Required		
<i>Cerastigma plumbaginoides</i>	Generic	5–9	Spring and Fall	102	70–72° F (21–22° C)	64–68° F (18–20° C)	Yes, 500–1000 ppp Quick Dip	Yes	6–7, 1 ppp	Pinch 7–10 days prior to transplant leaving 4–6 leaf nodes.	Not Required		
<i>Coreopsis grandiflora</i> Corey™	Syngenta Flowers	5–9	Spring	102	70–72° F (21–22° C)	64–68° F (18–20° C)	Yes, 500–1000 ppp Quick Dip	No	4–5, 1 ppp		Not Required		
<i>Erodium x variabile</i> Bishops Form	Generic	6–9	Spring	102	70–72° F (21–22° C)	64–68° F (18–20° C)	Yes, 500–1000 ppp Quick Dip	No	7–8, 1 ppp	Once rooted, avoid moisture on foliage.	Cold Beneficial	6–7 45° F (7° C)	Bulk plants for 7–8 weeks 1 QT and 8–10 weeks 1 GAL prior to vernalization.
<i>Erysimum linifolium</i> Super Bowl™	Syngenta Flowers	6–9	Spring	102	70–72° F (21–22° C)	64–68° F (18–20° C)	Yes, 500–1000 ppp Quick Dip	Yes	6–7, 1 ppp	Pinch 7–10 days prior to transplant leaving 4–6 leaf nodes.	Cold Required	6–7 50° F (10° C)	Bulk plants for 6–7 weeks 1 GAL and 8–10 weeks 2 GAL prior to vernalization.
<i>Gaillardia aristata</i> Sunrita®	Syngenta Flowers	4–9	Late Spring	102	72–75° F (22–24° C)	65–68° F (18–20° C)	No	Disbud flowers only	4–5, 1 ppp	Once rooted, avoid moisture on foliage.	Not Required		
<i>Iberis sempervirens</i> Snow Cone™, Snowsurfer™	Syngenta Flowers	4–9	Early Spring	102	68–70° F (20–21° C)	60–64° F (16–18° C)	Yes, 500–1000 ppp Quick Dip	Yes	7–8, 1 ppp	Pinch 7–10 days prior to transplant leaving 4–6 leaf nodes.	Cold Required	7–8 40° F (4° C)	Bulk plants for 7–8 weeks 1 QT and 8–10 weeks 1 GAL prior to vernalization.
<i>Lamium maculatum</i> Beacon Silver	Generic	4–9	Spring	102	70–72° F (21–22° C)	60–64° F (16–18° C)	No	No	4–5, 1 ppp		Cold Beneficial	6–7 45° F (7° C)	Bulk plants for 4–5 weeks 1 QT and 6–7 weeks 1 GAL prior to vernalization.
<i>Lavandula angustifolia</i> Aromatico™, Sentivia™	Syngenta Flowers	5–9	Summer	102	70–72° F (21–22° C)	64–68° F (18–20° C)	Yes, 500–1000 ppp Quick Dip	Yes	6–7, 1 ppp	Once roots are initiated, avoid excessive moisture on foliage.	Not Required		

ppp = plants per pot, N/A = not applicable, wks=weeks

FINISHING GUIDELINES AND SCHEDULES			CULTURAL GUIDELINES					
Suggested Pot Sizes : ppp : Finish Crop Time	Temperature (Day/Night)	Photoperiod (Day Length)	Media pH	Media EC (mS/cm)	Fertilizer Rate (ppm N)	Plant Growth Regulator (PGR) Spray (S) Drench (D)	Insects & Diseases	Comments
1 GAL : 1 ppp : 8–10 wks 2 GAL : 3 ppp : 9–11 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Obligate Long Day	5.8–6.4	1.5–2.0	150–200 or 250 as needed	B-Nine® (S) 2500 ppm or Bonzi® (S) 10–20 ppm	Aphids, Spider Mites, Whitefly, Thrips, Powdery Mildew	Pinch at transplant to encourage branching. Plants use a lot of water when they reach maturity. Producing them under long days will hasten flowering.
1 QT : 1 ppp : 5–6 wks 1 GAL : 1 ppp : 6–7 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Day Neutral	5.8–6.8	1.25–1.75	50–75 or 150 as needed	Sumagic® (S) 2.5 ppm	Aphids, Spider Mites, Whitefly, Botrytis, Pythium, Rhizoctonia, Scale	Spring flowering only occurs with vernalization, fall transplant for spring flowers.
1 QT : 1 ppp : 5–6 wks 1 GAL : 1 ppp : 6–7 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Obligate Long Day	5.5–6.5	1.25–1.75	50–75 or 150 as needed	Bonzi® (S) 30 ppm	Aphids, Powdery Mildew	Can be used as a fall flowering perennial too. Transplant liners in late summer for fall flowering.
1 QT : 1 ppp : 5–6 wks 1 GAL : 1 ppp : 6–7 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Day Neutral	5.5–6.5	1.25–1.75	50–75 or 150 as needed	B-Nine® (S) 2500 ppm	Aphids, Botrytis, Pythium, Rhizoctonia	If possible, grow cool to help keep the plants compact and uniform. Make sure pots are not too wet or waterlogged going into the cold treatment. Keep fertility on the low side going into vernalization.
1 GAL : 1 ppp : 14–16 wks 2 GAL : 3 ppp : 16–18 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Obligate Long Day	5.8–6.8	1.5–2.0	150–200 or 250 as needed	B-Nine® (S) 2500 ppm or Bonzi® (S) 30 ppm	Spider Mites, Thrips, Whitefly, Powdery Mildew	Bulk under <12 hours of light for 4–5 weeks before long day period.
1 QT : 1 ppp : 10–11 wks 1 GAL : 1 ppp : 12–14 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Day Neutral	5.8–6.8	1.25–1.75	50–75 or 150 as needed	B-Nine® (S) 2500 ppm or Bonzi® (S) 30 ppm	Spider Mites, Thrips, Pythium, Rhizoctonia	Can be used as a fall flowering perennial too. Transplant liners in late summer for fall flowering.
1 QT : 1 ppp : 7–8 wks 1 GAL : 1 ppp : 8–10 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Obligate Long Day	5.8–6.8	1.5–2.0	150–200 or 250 as needed	B-Nine® (S) 2500 ppm or Bonzi® (S) 30 ppm	Thrips, Whitefly, Downy Mildew, Powdery Mildew, Scale	Can be used as a fall flowering perennial too. Transplant liners in late summer for fall flowering.
1 QT : 1 ppp : 5–6 wks 1 GAL : 1 ppp : 6–7 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Day Neutral	5.5–6.5	1.25–1.75	50–75 or 150 as needed	Usually not needed	Spider Mites, Thrips, Whitefly, Downy Mildew	Fall transplant for best results. 6–8 weeks of bulking required before vernalization period can commence.
1 QT : 1 ppp : 5–6 wks 1 GAL : 1 ppp : 6–7 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Facultative Long Day	5.5–6.5	1.5–2.0	150–200 or 250 as needed	Bonzi® (S) 30 ppm or Sumagic® (S) 5 ppm	Aphids, Whitefly, Downy Mildew, Powdery Mildew	Bulk in finished container prior to vernalization period.
1 GAL : 1 ppp : 9–11 wks 2 GAL : 3 ppp : 9–11 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Obligate Long Day	5.8–6.8	1.5–2.0	150–200 or 250 as needed	B-Nine® (S) 2500 ppm or Bonzi® (S) 30 ppm	Aphids, Spider Mites, Powdery Mildew, Pythium, Scale, Smut	Disbud flowers as needed during propagation. Pinch at transplant. Grows best under long days and high light levels. They do not tolerate wet growing conditions. Yellow and tangerine are slightly more vigorous than others in the line.
1 QT : 1 ppp : 5–6 wks 1 GAL : 1 ppp : 6–7 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Day Neutral	5.5–6.5	1.25–1.75	50–75 or 150 as needed	Bonzi® (D) 3–5 ppm at visible bud or Bonzi® (S) 30 ppm	Aphids, Thrips, Downy Mildew, Powdery Mildew, Scale	Snow Cone best utilized in 1 QT containers and Snowsurfer in 1 GAL containers.
1 QT : 1 ppp : 5–6 wks 1 GAL : 1 ppp : 6–7 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Day Neutral	5.8–6.8	1.5–2.0	150–200 or 250 as needed	B-Nine® (S) 2500 ppm or Bonzi® (S) 30 ppm	Spider Mites, Thrips, Whitefly, Downy Mildew, Powdery Mildew	
1 QT : 1 ppp : 10–12 wks 1 GAL : 1 ppp : 13–15 wks 2 GAL : 3 ppp : 14–16 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Facultative Long Day	6.2–6.8	1.25–1.75	150–200 or 250 as needed	Bonzi® (D) 3–5 ppm at visible bud, B-Nine® (S) 2500 ppm or Bonzi® (S) 30 ppm	Aphids, Spider Mites, Whitefly, Phytophthora, Pythium	Excellent clones for short crop times in spring. No vernalization required for flowering. High oil content leads to a strong fragrance.

Vegetative Perennials Guidelines and Schedules

ASSORTMENT				PROPAGATION GUIDELINES							VERNALIZATION		
Species / Series	Genetic Owner	Hardiness (USDA Zone)	Blooming Season	Plug Size	Rooting Temp.	Temps After Rooted	Rooting Hormone	Pinch in Prop	Rooting Time (wks)	Comments	Vernalization Requirement	Duration (wks) & Temperature (ADT)	Comments
<i>Lavandula angustifolia</i> Hidcote	Generic	5-9	Late Spring to Summer	102	70–72°F (21–22°C)	64–68°F (18–20°C)	Yes, 500-1000ppp Quick Dip	Yes	6–7, 1 ppp	Once roots are initiated, avoid excessive moisture on foliage.	Cold Required	7–8: 40° F (4° C)	Bulk plants for 5 to 6 weeks 1QT and 6 to 7weeks 1GAL prior to vernalization.
<i>Lavandula stoechas</i> Javelin™	Syngenta Flowers	6–9	Spring	102	68–70° F (20–21° C)	64–68° F (18–20° C)	Yes, 500–1000 ppp Quick Dip	Yes	6–7, 1 ppp	Once roots are initiated, avoid excessive moisture on foliage.	Cold Required	6–7 50° F (10° C)	Bulk plants for 5–6 weeks 1 QT, 6–7 weeks 1 GAL and 8–10 weeks 2 GAL prior to vernalization.
<i>Leucanthemum maximum</i> Western Star	Syngenta Flowers	5–9	Late Spring	102	68–70° F (20–21° C)	64–68° F (18–20° C)	Yes, 500–1000 ppp Quick Dip	No	4–5, 1 ppp	Transplant timely so root system does not dislodge liner from tray.	Cold Beneficial	6–7 45° F (7° C)	Bulk plants for 4–5 weeks 1 GAL and 5–6 weeks 2 GAL prior to vernalization.
<i>Lithodora diffusa</i> Grace Ward	Generic	6–9	Early Spring	102	68–70° F (20–21° C)	64–68° F (18–20° C)	Yes, 500–1000 ppp Quick Dip	Yes	8–9, 1 ppp	Pinch 7 to 10 days prior to transplant leaving 4 to 6 leaf nodes.	Cold Beneficial	6–7 50° F (10° C)	Bulk plants for 7–8 weeks 1 QT and 8–10 weeks 1 GAL prior to vernalization.
<i>Penstemon hartwegii</i> Phoenix™	Syngenta Flowers	7–9	Summer	102	70–72° F (21–22° C)	64–68° F (18–20° C)	No	Yes	4–5, 1 ppp	Pinch 7 to 10 days prior to transplant leaving 4 to 6 leaf nodes.	Not Required		
<i>Phlox douglasii</i> Admiral™	Generic	4–9	Spring	102	68–70° F (20–21° C)	64–68° F (18–20° C)	Yes, 500–1000ppp Quick Dip	Yes	8–9, 1 ppp	Pinch 7 to 10 days prior to transplant leaving 4 to 6 leaf nodes.	Cold Required	6–7 45° F (7° C)	Bulk plants for 7–8 weeks 1 QT and 8–10 weeks 1 GAL prior to vernalization.
<i>Phlox paniculata</i> Peacock™	Syngenta Flowers	4–9	Summer	102	70–72° F (21–22° C)	64–68° F (18–20° C)	Yes, 500–1000 ppp Quick Dip	Yes	6–7, 1 ppp	Pinch 7 to 10 days prior to transplant leaving 4 to 6 leaf nodes.	Not Required		
<i>Phlox subulata</i>	Generic	3–9	Early Spring	102	68–70° F (20–21° C)	64–68° F (18–20° C)	Yes, 500–1000 ppp Quick Dip	Yes	8–9, 1 ppp	Pinch 7 to 10 days prior to transplant leaving 4 to 6 leaf nodes.	Cold Required	7–8 40° F (4° C)	Bulk plants for 7–8 weeks 1 QT and 8–10 weeks 1 GAL prior to vernalization.
<i>Salvia officinalis</i>	Generic	4–9	Spring	102	70–72° F (21–22° C)	64–68° F (18–20° C)	No	Yes	4–5, 1 ppp	Pinch 7 to 10 days prior to transplant leaving 4 to 6 leaf nodes.	Not Required		
<i>Salvia x superba</i> Bordeaux™	Syngenta Flowers	4–9	Spring	102	70–72° F (21–22° C)	64–68° F (18–20° C)	Yes, 500–1000 ppp Quick Dip	No	5–6, 1 ppp	Reduce moisture once rooted to promote root development.	Cold Beneficial	6–7 45° F (7° C)	Bulk plants for 5–6 weeks 1 QT, 6–7 weeks 1 GAL and 8–10 weeks 2 GAL prior to vernalization.

ppp = plants per pot, N/A = not applicable, wks=weeks

FINISHING GUIDELINES AND SCHEDULES			CULTURAL GUIDELINES					
Suggested Pot Sizes : ppp : Finish Crop Time	Temperature (Day/Night)	Photoperiod (Day Length)	Media pH	Media EC (mS/cm)	Fertilizer Rate (ppm N)	Plant Growth Regulator (PGR) Spray (S) Drench (D)	Insects & Diseases	Comments
1 QT: 1PPP: 5-6 wks 1 GAL: 1PPP: 6-7 wks	65 - 75°F (18-24°C)/ 55-65°F (13-18°C)	Facultative Long Day	6.2-6.8	1.25-1.75	150-200; or 250 as Needed	Bonzi® (D) 3-5 ppm at visible bud, B-Nine® (S) 2500 ppm or Bonzi® (S) 30 ppm	Aphids, Spider Mites, Whitefly, Phytophthora, Pythium	Excellent clone for growers overwintering their crops outside with minimal protection.
1 QT : 1 ppp : 5-6 wks 1 GAL : 1 ppp : 6-7 wks	65-75° F (18-24° C)/ 55-65° F (13-18° C)	Facultative Long Day	5.8-6.8	1.25-1.75	50-75 or 150 as needed	Bonzi® (D) 3-5 ppm at visible bud, B-Nine® (S) 2500 ppm or Bonzi® (S) 30 ppm	Aphids, Spider Mites, Whitefly, Phytophthora, Pythium	Large bracts add to the attraction of the plants in this series. In cool climates, plants will flower into the summer and fall months.
1 GAL : 1 ppp : 6-8 wks 2 GAL : 3 ppp : 8-9 wks	70-85° F (21-29° C)/ 60-65° F (16-18° C)	Obligate Long Day	5.8-6.8	1.5-2.0	150-200 or 250 as needed	Bonzi® (D) 3-5 ppm at visible bud, B-Nine® (S) 2500 ppm or Bonzi® (S) 30 ppm	Spider Mites, Thrips, Powdery Mildew	Excellent medium height Shasta daisy! Vernalization will bring the crop to uniform flowering in late spring for a row-run harvest.
1 QT : 1 ppp : 5-6 wks 1 GAL : 1 ppp : 6-7 wks	65-75° F (18-24° C)/ 55-65° F (13-18° C)	Facultative Long Day	5.5-6.5	1.25-1.75	50-75 or 150 as needed	Usually not needed	Aphids, Spider Mites, Phytophthora, Pythium	Excellent addition to early spring mix!
1 GAL : 1 ppp : 8-10 wks 2 GAL : 3 ppp : 9-11 wks	70-85° F (21-29° C)/ 60-65° F (16-18° C)	Day Neutral	5.8-6.2	2.0-2.5	100-125 or 200-250 as needed	B-Nine® (S) 2500 ppm, B-Nine® (S) 2500 ppm + Cycocel® (S) 1000 ppm, Sumagic® (S) 5-10 ppm	Aphids, Thrips, Spider Mites, Basel Stem Rot, Powdery Mildew	Phoenix penstemons have been updated and are not as vigorous as the old line. Use PGRs as necessary to keep plants under control. Avoid using Florel since this will severely delay flowering. Plants need 1 early pinch, but can also be pinched again later if needed for larger containers. Keep the plants well-fed to maintain dark healthy leaves.
1 QT : 1 ppp : 6-7 wks 1 GAL : 3 ppp : 8-9 wks	65-75° F (18-24° C)/ 55-65° F (13-18° C)	Facultative Long Day	5.5-6.5	1.25-1.75	50-75 or 150 as needed	Usually not needed	Aphids, Spider Mites, Whiteflies, Botrytis, Downy Mildew, Thielaviopsis, Fungal Root Rot	Excellent series to extend the Phlox subulata flowering season.
1 GAL : 1 ppp : 14-16 wks 2 GAL : 3 ppp : 16-18 wks	70-85° F (21-29° C)/ 60-65° F (16-18° C)	Obligate Long Day	5.8-6.4	1.5-2.0	150-200 or 250 as needed	Bonzi® (D) 3-4 ppm or B-Nine® (S) 2500 ppm + Sumagic® (S) 5 ppm tank mix	Aphids, Spider Mites, Thrips, Whiteflies, Downy Mildew, Cercospora Leaf Spot, Powdery Mildew, Scale	Watch for powdery mildew. Peacocks have been bred for improved powdery mildew resistance. Violet and White are exceptionally strong performers.
1 QT : 1 ppp : 5-6 wks 1 GAL : 1 ppp : 6-7 wks	65-75° F (18-24° C)/ 55-65° F (13-18° C)	Day Neutral	5.8-6.4	1.25-1.75	150-200 or 250 as needed	Usually not needed	Aphids, Spider Mites, Whitefly, Botrytis, Downy Mildew, Thielaviopsis, Fungal Root Rot	Pinch at transplant to encourage branching. Pinch as needed during finished to shape plant. Use clean implements and good sanitation when pinching.
1 QT : 1 ppp : 9-11 wks 1 GAL : 1 ppp : 10-12 wks 2 GAL : 3 ppp : 11-13 wks	70-85° F (21-29° C)/ 60-65° F (16-18° C)	Obligate Long Day	5.8-6.8	1.5-2.0	150-200 or 250 as needed	B-Nine® (S) 2500 ppm	Aphids, Spider Mites, Thrips, Whitefly, Downy Mildew, Powdery Mildew, Rhizoctonia, Thielaviopsis	
1 QT : 1 ppp : 5-6 wks 1 GAL : 1 ppp : 6-7 wks 2 GAL : 3 ppp : 8-9 wks	70-85° F (21-29° C)/ 60-65° F (16-18° C)	Facultative Long Day	5.8-6.2	1.5-2.0	150-200 or 250 as needed	B-Nine® (S) 2500 ppm or Bonzi® (S) 30 ppm	Aphids, Spider Mites, Thrips, Whitefly, Downy Mildew, Powdery Mildew, Rhizoctonia, Thielaviopsis	Excellent uniform series for spring flowering. Strong bold colors and plant habit.



Vegetative Perennials Guidelines and Schedules




ASSORTMENT				PROPAGATION GUIDELINES							VERNALIZATION		
Species / Series	Genetic Owner	Hardiness (USDA Zone)	Blooming Season	Plug Size	Rooting Temp.	Temps After Rooted	Rooting Hormone	Pinch in Prop	Rooting Time (wks)	Comments	Vernalization Requirement	Duration (wks) & Temperature (ADT)	Comments
<i>Saxifraga x arendsii</i> Alpino™, Touran™	Syngenta Flowers	4–9	Early Spring	102	68–70° F (20–21° C)	64–68° F (18–20° C)	Yes, 500–1000 ppp Quick Dip	No	6–7, 1 ppp	Once roots are initiated, avoid excessive moisture on foliage.	Cold Required	6–7 45° F (7° C)	Bulk plants for 5–6 weeks 1 QT and 6–7 weeks 1 GAL prior to vernalization.
<i>Sedum</i> (Groundcover Types) <i>acre</i> Aurea, <i>album</i> Coral Carpet, <i>kamtschaticum</i> Variegatum, <i>sediforme</i> Gold, <i>sexangulare</i> , <i>sieboldii</i> , <i>sieboldii</i> Mediovariegatum, <i>spurium</i> Variegatum & <i>tetractinum</i> Coral Reef	Generic	4–9	Summer	102	70–72° F (21–22° C)	64–68° F (18–20° C)	No	No	4–5, 1 ppp	Reduce moisture once rooted to promote root development.	Not Required		
<i>Sedum hybridum</i> Matrona, Munstead Dark Red, <i>Sedum telephium</i> Herbstfreude	Generic	4–9	Fall	102	70–72° F (21–22° C)	64–68° F (18–20° C)	No	No	4–5, 1 ppp	Propagate in <11 hours light if possible for best results.	Not Required		
<i>Thymus citriodorus</i> Aureus, Doone Valley, Lemon King & Silver Queen	Generic	5–9	Spring	102	70–72° F (21–22° C)	64–68° F (18–20° C)	No	Yes	5–6, 2 ppp	Pinch 7–10 days prior to transplant leaving 4–6 leaf nodes.	Not Required		
<i>Thymus praecox</i> Coccineus	Generic	5–9	Spring	102	70–72° F (21–22° C)	64–68° F (18–20° C)	No	Yes	5–6, 2 ppp	Pinch 7–10 days prior to transplant leaving 4–6 leaf nodes.	Not Required		
<i>Vinca minor</i>	Generic	4–9	Spring	102	70–72° F (21–22° C)	64–68° F (18–20° C)	Yes, 500–1000 ppp Quick Dip	No	5–6, 2 ppp	Reduce moisture once rooted to promote root development.	Cold Beneficial	6–7 45° F (7° C)	Bulk plants for 7–8 weeks 1 QT and 8–10 weeks 1 GAL prior to vernalization.
<i>Viola cornuta</i> Etain & <i>Viola hybrida</i> Rebecca	Generic	5–9	Early Spring	102	68–70° F (20–21° C)	64–68° F (18–20° C)	Yes, 500–1000 ppp Quick Dip	No	6–7, 1 ppp	Once roots are initiated, avoid excessive moisture on foliage.	Cold Beneficial	6–7 50° F (10° C)	Bulk plants for 4–5 weeks 1 QT and 6–7 weeks 1 GAL prior to vernalization.

ppp = plants per pot, N/A = not applicable, wks=weeks

FINISHING GUIDELINES AND SCHEDULES			CULTURAL GUIDELINES					
Suggested Pot Sizes : ppp : Finish Crop Time	Temperature (Day/Night)	Photoperiod (Day Length)	Media pH	Media EC (mS/cm)	Fertilizer Rate (ppm N)	Plant Growth Regulator (PGR) Spray (S) Drench (D)	Insects & Diseases	Comments
1 QT : 1 ppp : 5–6 wks 1 GAL : 1 ppp : 6–7 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Day Neutral	5.8–6.4	1.25–1.75	150–200 or 250 as needed	Usually not needed	Aphids, Botrytis, Powdery Mildew, Rust	Make sure unrooted cuttings are in good contact with media when sticking. Plants benefit from early feeding in propagation. Plants need very well- drained soils in the landscape.
1 QT : 1 ppp : 8–10 wks 1 GAL : 1 ppp : 14–16 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Obligate Long Day	5.8–6.8	1.5–2.0	150–200 or 250 as needed	Bonzi® (S) 30 ppm	Whitefly, Powdery Mildew	Excellent ground cover and summer flowering perennials.
1 GAL : 1 ppp : 20–22 wks 2 GAL : 3 ppp : 22–24 wks	70–85° F (21–29° C)/ 60–65° F (16–18° C)	Obligate Long Day	5.8–6.8	1.5–2.0	150–200 or 250 as needed	Bonzi® (S) 30 ppm	Whitefly, Powdery Mildew	
1 QT : 1 ppp : 8–10 wks 1 GAL : 1 ppp : 14–16 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Obligate Long Day	5.8–6.4	1.25–1.75	150–200 or 250 as needed	Sumagic® (S) 2.5 ppm	Botrytis, Downy Mildew, Pythium, Rhizoctonia	They do not tolerate overly wet growing conditions.
1 QT : 1 ppp : 8–10 wks 1 GAL : 1 ppp : 14–16 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Obligate Long Day	5.8–6.4	1.25–1.75	50–75 or 150 as needed	Sumagic® (S) 2.5 ppm	Botrytis, Downy Mildew, Pythium, Rhizoctonia	They do not tolerate overly wet growing conditions.
1 QT : 1 ppp : 6–7 wks 1 GAL : 3 ppp : 8–9 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Obligate Long Day	5.5–6.5	1.5–2.0	150–200 or 250 as needed	B-Nine® (S) 2500 ppm or Bonzi® (S) 30 ppm	Spider Mites, Thrips, Pythium, Rhizoctonia	Excellent ground cover and spring flowering perennials.
1 QT : 1 ppp : 5–6 wks 1 GAL : 1 ppp : 6–7 wks	65–75° F (18–24° C)/ 55–65° F (13–18° C)	Day Neutral	5.5–6.5	1.25–1.75	50–75 or 150 as needed	Usually not needed	Spider Mites, Powdery Mildew	Grow under Pansy culture for best results. Early season color at retail that takes the cold.

Perennial Blooming Season

	SEED	VEGETATIVE
 <p>Early Spring</p>	<p><i>Arabis blepharophylla</i> Rose Delight™ <i>Arabis caucasica</i> Little Treasure™ <i>Arenaria montana</i> Blizzard™ <i>Aubrieta hybrida</i> Audrey™ <i>Aurinia saxatilis</i> (alyssum) Summit™ <i>Doronicum orientale</i> Leonardo™ <i>Erysimum hybridum</i> Canaries™ <i>Iberis sempervirens</i> Tahoe™ <i>Papaver nudicaule</i> Pulchinella™, Spring Fever™ <i>Primula denticulata</i> Corolla™ <i>Primula rosea</i> Rosy™ <i>Primula veris</i> Cabrillo™ <i>Saxifraga arendsii</i> Highlander™</p>	<p><i>Arenaria montana</i> Summer White <i>Aubrieta hybrida</i> Axcent™ <i>Iberis sempervirens</i> Snow Cone™, Snowsurfer™ <i>Lithodora diffusa</i> Grace Ward <i>Phlox subulata</i> <i>Saxifraga x arendsii</i> Alpino™, Touran™ <i>Viola hybrida</i> Rebecca <i>Viola cornuta</i> Etain</p>
 <p>Spring</p>	<p><i>Aquilegia caerulea</i> Origami™ <i>Coreopsis grandiflora</i> Andiamo™ <i>Dianthus barbatus</i> Barbarini® <i>Heuchera americana</i> Marvelous Marble™ <i>Heuchera sanguinea</i> Coral Forest™ <i>Lavandula stoechas</i> Castilliano™ <i>Salvia x superba</i> Merleau®</p>	<p><i>Ajuga reptans</i> Braunherz, Burgundy Glow <i>Ceratostigma plumbaginoides</i> <i>Coreopsis grandiflora</i> Corey™ <i>Erodium x variable</i> Bishops Form <i>Erysimum linifolium</i> Super Bowl™ <i>Lamium maculatum</i> Beacon Silver <i>Lavandula stoechas</i> Javelin™ <i>Phlox douglasii</i> Admiral™ <i>Salvia officinalis</i> <i>Salvia x superba</i> Bordeaux™ <i>Thymus citriodorus</i> Aureus, Doone Valley, Lemon King & Silver Queen <i>Thymus praecox</i> Coccineus <i>Vinca minor</i></p>

	SEED	VEGETATIVE
 <h2>Late Spring</h2>	<p><i>Echinacea purpurea</i> Prairie Splendor™ <i>Delphinium elatum</i> Excalibur™ <i>Digitalis purpurea</i> Camelot™</p>	<p><i>Achillea millifolium</i> Desert Eve™ <i>Campanula interspecific</i> Beyond Blue <i>Gaillardia aristata</i> Sunrita® <i>Leucanthemum maximum</i> Western Star</p>
 <h2>Summer</h2>	<p><i>Campanula cochlearifolia</i> Swinging Bells™ <i>Campanula garganica</i> Filligree™ <i>Campanula glomerata</i> Bellefleur™ <i>Campanula portenschlagiana</i> Clockwise™ <i>Campanula rapunculoides</i> Cambell™ <i>Delphinium grandiflorum</i> Delfix® <i>Lavandula angustifolia</i> Scent™ <i>Penstemon hartwegii</i> Arabesque™ <i>Rudbeckia hirta</i> TigerEye™ <i>Sedum nevii</i> Silver Frost™ <i>Sedum pulchellum</i> Sea Star™ <i>Sedum spurium</i> Solarity™</p>	<p><i>Lavandula angustifolia</i> Aromatico™, Hidcote, Sentivia™ <i>Penstemon hartwegii</i> Phoenix™ <i>Phlox paniculata</i> Peacock™ <i>Sedum acre</i> Aurea <i>Sedum album</i> Coral Carpet <i>Sedum kamtschaticum variegatum</i> <i>Sedum mediovariegatum</i> <i>Sedum sediforme</i> Gold & Silver <i>Sedum sexangulare</i> <i>Sedum spurium variegatum</i> <i>Sedum tetractinum</i> Coral Reef</p>
 <h2>Fall</h2>	<p><i>Anemone hupehensis</i> Pink Saucer™ <i>Sedum telephium</i> Surrender™</p>	<p><i>Ceratostigma plumbaginoides</i> <i>Sedum telephium</i> Herbstfreude <i>Sedum hybridum</i> Matorna, Munstead Dark Red <i>Sedum sieboldii</i></p>

Pictured on front: *Campanula Clockwise™* Deep Blue
Pictured on back: *Gaillardia Sunrita™* Burgundy



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