

seed perennials guidelines and schedules

		Propagation Guidelines						Cold Treatment—Vernalization			Finished Guidelines And Schedules			Cultural Guidelines						
Species	Hardiness (USDA Zone)	Plug Size	Seeds/ Plug	Cover Seed	Germ. Temp (Stage 1)	Stage 2–3 Temp.	Plug Time (wks)	Cold Requirement	Duration (wks)	Comments	Finish Time (wks)	Temperature (Day/Night)	Photoperiod (Day Length)	Media pH	Media EC (mS/cm) SME	Fertilizer Rate (ppm N)	Irrigation Requirements	Insects & Diseases	PGR (S) Spray (D) Drench	Comments
Achillea Golden Fleece™ <i>Achillea tomentosa</i>	4–9	288	3	Light Cover	65–70°F (18–21°C)	60–65°F (16–18°C)	6–7	Cold Beneficial	6–9	First-year flowering perennial. No vernalization needed. Will flower more uniformly if vernalized.	6–7, 1–3 ppp	60–65°F (15–18°C)	Long Day Beneficial	5.8–6.4	1.25–1.75	50–75; or 150 as Needed	Slightly Dry–Average	Aphids, Powdery Mildew, <i>Rhizoctonia</i>	B-9 (S) 2500 ppm or Bonzi (S) 10 ppm	Keep foliage as dry as possible when growing—excess moisture and humidity can cause leaf rot. Good drought tolerance in the landscape.
Alyssum Summit™ <i>Aurinaria saxatilis</i>	3–8	288	3–4	No Cover	65–72°F (18–22°C)	64–68°F (18–20°C)	6–7	Cold Required	5–8	Transplant in late summer to early fall.	5–6, 2–3 ppp	64°F (15°C)	Day Neutral	5.5–6.4	1.25–1.75	50–75; or 150 as Needed	Average	Aphids, Downy Mildew	B-9 (S) 2500 ppm	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.
Alyssum Tekara™ <i>Alyssum montanum</i>	4–9	288	3	No—Light Required for Germination	65–72°F (18–22°C)	64–68°F (18–20°C)	5–6	Cold Required	5–8	Transplant in late summer to early fall.	5–6, 2 ppp	64°F (15°C)	Day Neutral	5.5–6.4	1.25–1.75	50–75; or 150 as Needed	Average	Aphids, Downy Mildew	B-9 (S) 2500 ppm	Tekara can become vigorous under warm growing conditions—grow plants cool and under reduced feed to keep under control. Watch for Downy Mildew under high humidity and prolonged leaf wetness. Good plant for rock gardens and walls.
Anemone Pink Saucer™ <i>Anemone hupehensis</i>	4–8	288	3	Light Cover	60–65°F (16–18°C)	60–65°F (16–18°C)	10–12	Not Required	NA	First-year flowering perennial with high flower count. No vernalization needed. Plants flower naturally in August.	12–14, 1 ppp	68°F (20°C)	Long Day Required	5.6–6.2	1.5–2.0	150–200 from calcium-based fertilizers	Average	Thrips, <i>Botrytis</i>	Bonzi (D) 2 ppm	Cold treatment after sowing breaks seed dormancy and enhances germination. Improved color stability and uniformity in flowering.
Arabis Little Treasure™ <i>Arabis caucasica</i>	3–7	288	3–4	No—Light Required for Germination	65–70°F (18–21°C)	60–65°F (16–18°C)	6–7	Cold Required	5–8	Transplant in late summer to early fall.	5–6, 2–3 ppp	60–65°F (15–18°C)	Long Day Beneficial	5.5–6.5	1.25–1.75	50–75; or 150 as Needed	Average	Aphids, <i>Botrytis</i> , <i>Pythium</i> , <i>Rhizoctonia</i>	B-9 (S) 2500 ppm	Best used in small containers (4-inch to quarts) using 1 ppp.
Arabis Rose Delight™ <i>Arabis blepharophylla</i>	3–7	288	3–4	Light Cover	68–72°F (20–22°C)	60–65°F (16–18°C)	7–8	Cold Beneficial	5–8	Transplant in late summer to early fall.	7–8, 2–3 ppp	65°F (15°C)	Long Day Beneficial	5.5–6.5	1.25–1.75	50–75; or 150 as Needed	Average	Aphids, <i>Botrytis</i> , <i>Pythium</i> , <i>Rhizoctonia</i>	B-9 (S) 2500 ppm	Best used in small containers (4-inch to quarts) using 1 ppp.
Campanula Bellefleur™ <i>Campanula glomerata</i>	3–8	288	3–4	No—Light Required for Germination	68–72°F (20–22°C)	65–68°F (18–20°C)	8–9	Cold Beneficial	6–10	First-year flowering perennial. Vernalization reduces the time of flower by 2 to 3 week.	8–9, 1–3 ppp	65–68°F (18–20°C)	Long Day Required	6.0–6.4	1.25–1.75	50–75; or 150 as Needed	Average	Aphids, Spider Mites, Whiteflies, <i>Botrytis</i> , <i>Pythium</i>	B-9 (S) 2500 ppm; Bonzi (S) 15 ppm; Sumagic (S) 3–5 ppm as Needed	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.
Campanula Cambell™ <i>Campanula apunculoides</i>	3–8	288	3–4	No—Light Required for Germination	68–72°F (20–22°C)	65–68°F (18–20°C)	9–10	Not Required	NA		8–9, 1–3 ppp	65–68°F (18–20°C)	Long Day Required	5.5–6.0	1.25–1.5	50–75; or 150 as Needed	Average	Aphids, Spider Mites, Whiteflies, <i>Botrytis</i> , <i>Pythium</i>	B-9 (S) 2500 ppm	Sensitive to high salts. Afternoon shade will help increase bloom longevity in very warm southern landscapes.
Campanula Thumbell™ <i>Campanula rotundifolia</i>	3–8	288	3–4	No—Light Required for Germination	65–72°F (18–22°C)	62–65°F (17–18°C)	9–10	Not Required	NA		6–7, 1–3 ppp	65°F (15°C)	Long Day Required	5.5–6.0	1.25–1.5	50–75; or 150 as Needed	Average	Aphids, Spider Mites, Whiteflies, <i>Botrytis</i> , <i>Pythium</i>	B-9 (S) 2500 ppm	Sensitive to high salts. Afternoon shade will help increase bloom longevity in very warm southern landscapes.
Coreopsis Heliot™, Santa Fe™ <i>Coreopsis grandiflora</i>	5–10	288	3	Light Cover	65–72°F (18–22°C)	65–68°F (18–20°C)	6–7	Cold Beneficial	6–10	First-year flowering perennial. However, Heliot flowers much earlier and more uniformly if vernalized.	8–9, 1–3 ppp	65–68°F (18–20°C)	Long Day Required	5.8–6.5	1.5–2.0	75–100; or 200 as Needed	Average Early–Above Average Late	Aphids, Thrips, Whiteflies, Powdery Mildew	B-9 (S) 2500 ppm; Bonzi (S) 3–6 ppm; Sumagic (S) 2–4 ppm; Bonzi (D) 2 ppm	Heliot benefits from vernalization versus Santa Fe. Seed should be sown in early January or bring in vernalized plugs to bring Heliot into flower for early summer. Later sowings result in significantly later flowering. PGRs can delay flowering slightly on coreopsis. Dead-head old flowers in the landscape to keep plants looking fresh.
Corydalis Manchu™ <i>Corydalis cheilanthifolia</i>	5–8	288	3–4	Light Cover	65–72°F (18–22°C)	62–65°F (17–18°C)	8–9	Cold Required	5–8	Transplant in late summer to early fall.	12–15, 1–3 ppp	60–65°F (15–18°C)	Day Neutral	5.6–6.4	1.25–1.75	50–75; or 150 as Needed	Average	Thrips, Rust		Fern-like bronze foliage adds character to the plant.

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Delphinium Delfix® <i>Delphinium grandiflorum</i>	5–7	288	3	Light Cover	65–72°F (18–22°C)	64–68°F (18–20°C)	7–8	Not Required	NA	First-year flowering perennial. No vernalization needed.	9–10, 3 ppp	60–65°F (15–18°C)	Long Day Beneficial	6.0–6.5	1.5–2.0	75–100; or 200 as Needed	Average	Aphids, Whiteflies, <i>Pythium</i>	Bonzi (S) 15 ppm. Apply 1 or 2 Applications 10–14 Days Apart.	Good plant for small containers (4-inch to quarts) using 1 ppp. Very uniform to flower. Keep feed levels up throughout production.
Delphinium Excalibur® <i>Delphinium elatum</i>	4–7	200–288	2–3	Light Cover	65–72°F (18–22°C)	64–68°F (18–20°C)	7–8	Not Required	NA	First-year flowering perennial. No vernalization needed.	9–10, 1 ppp	60–65°F (15–18°C)	Long Day Beneficial	6.0–6.5	1.5–2.0	75–100; or 200 as Needed	Average	Aphids, Whiteflies, <i>Pythium</i> , Fungal Leaf Spot	Bonzi (S) 15 ppm. Apply 1 or 2 Applications 10–14 Days Apart.	Best in 6-inch and larger containers. Keep feed levels up throughout production.
Dianthus Barbarini® F1 <i>Dianthus barbatus</i>	4–9	288	3	Light Cover	65–72°F (18–22°C)	62–65°F (17–18°C)	6–7	Not Required	NA	First-year flowering perennial. Can be transplanted in late summer to early fall for early spring sales.	8–9, 1 ppp	65°F (15°C)	Long Day Required	5.5–6.2	1.0–1.5	50–75; or 150 as Needed	Average	Aphid, Thrips, Whiteflies, <i>Botrytis</i> , <i>Pythium</i>	Bonzi (S) 20 ppm; B-9 (S) 2500 ppm; Sumagic (S) 3–5 ppm	A light Bonzi spray (1/8 ppm) at sowing helps keep seed intact and results in more uniform seedling stands. Calcium deficiency causes tip burn of young leaves—provide foliar Ca sprays if needed. Barbarini is a very heat tolerant dianthus. Transplant in late summer to early fall for following early spring sales. Transplant in early spring for summer flowering.
Digitalis Crème Belle <i>Digitalis ambigua</i>	4–8	288	1–2	Light Cover	64–68°F (18–20°C)	62–65°F (17–18°C)	6–7	Not Required	NA	First-year flowering perennial. Can be transplanted in late summer to early fall for faster flowering.	7–8, 1 ppp	65°F (15°C)	Day Neutral	5.6–6.2	1.0–1.25	75–100 with each irrigation	Average	Aphids, <i>Botrytis</i>	B-9 (S) 2500 ppm or Sumagic (S) 5 ppm. Apply just as the flower spike begins to elongate.	Grow cool in the spring after rooting for the best and most predictable flowering.
Digitalis Virtuoso™ <i>Digitalis purpurea</i>	4–8	288	3–4	No Cover/ Light Cover	65–70°F (18–20°C)	64–68°F (18–20°C)	6–7	Not Required	NA	First-year flowering perennial. Can be transplanted in late summer to early fall for faster flowering.	9–10, 1 ppp	68°F (20°C)	Long Day Beneficial	5.8–6.2	1.25–1.5	75–125 with each irrigation	Average Early–Above Average Late	Aphids, <i>Botrytis</i>	B-9 (S) 2500 ppm or Sumagic (S) 5 ppm. Apply just as the flower spike begins to elongate.	Large plants that are best grown in gallon or larger containers. Will use a significant amount of water when mature.
Doronicum Leonardo™ <i>Doronicum orientale</i>	4–7	288	3	Light Cover	68–72°F (20–22°C)	64–68°F (18–20°C)	7–8	Cold Required	6–10	Transplant in late summer to early fall. Bulk in the final container size.	7–8, 1–2 ppp	60–65°F (15–18°C)	Day Neutral	5.5–6.2	1.5–2.0	75–100; or 150–200 as Needed	Average	Aphids, <i>Botrytis</i> , Powdery Mildew, <i>Pythium</i>	B-9 (S) 2000 ppm + Sumagic (S) 3 ppm Tank Mix (Usually Not Needed on Compact)	Avoid waterlogged conditions. Earlier and more uniform flowering than others on the market.
Echinacea Prairie Splendor™ <i>Echinacea purpurea</i>	3–9	288	2–4 (2 if Vernalized)	Heavy Cover	70–75°F (21–24°C)	65–70°F (18–21°C)	6–7	Cold Beneficial	9–12	First-year flowering perennial. Will flower earlier and produce more branches if vernalized.	10–12, 2–3 ppp	68°F (20°C)	Long Day Required	5.8–6.5	1.5–2.0	75–100; or 150–200 as Needed	Average Early–Above Average Late	Aphids, Whiteflies, Fusarium Fungal Leaf Spot	Bonzi (S) 15 ppm Using Multiple Applications or Bonzi (D) 2–3 ppm	Prairie Splendor is earlier and more compact than other echinaceas on the market. This is an excellent choice for southern markets.
Erysimum Canarias™ <i>Erysimum hybridum</i>	4–9	288	1–2	No Cover	68–72°F (20–22°C)	65–70°F (18–21°C)	6–7	Cold Beneficial	6–9	Vernalize for early spring sales. Provide long days for flowering if not vernalizing.	9–10, 1 ppp	65°F (15°C)	Long Day Required	5.8–6.2	1.5–2.0	75–100; or 150–200 as Needed	Average	Aphids, <i>Botrytis</i> , Powdery Mildew, <i>Rhizoctonia</i> , Rust	Bonzi (S) 15 ppm or B-9 (S) 2500 ppm + Cycocel (S) 1000 ppm Tank Mix	Vernalize for early spring sales or grow under long days of summer for selling with pansies and other fall products. Can be grown in quarts under shorter finishing times.
Gaillardia Granada™ <i>Gaillardia aristata</i>	3–9	288	3–4	Heavy Cover	65–72°F (18–22°C)	65–70°F (18–21°C)	6–7	Not Required	NA	First-year flowering perennial. No vernalization needed. Will flower earlier if vernalized.	7–8, 1–3 ppp	60–65°F (15–18°C)	Long Day Beneficial	5.8–6.8	1.5–2.0	75–100; or 150–200 as Needed	Average–Above Average	Aphids, <i>Pythium</i> , Smut	Bonzi (S) 20 ppm or Bonzi (D) 3–4 ppm. Best to manage irrigation and avoid excess nutrient levels.	They do not tolerate overly wet conditions.
Heuchera Coral Forest™ new <i>Heuchera sanguinea</i>	3–9	288	4–5	No Cover/ Light Cover	65–72°F (18–22°C)	64–68°F (18–20°C)	9–10	Cold Required	7–10	Transplant in late summer to early fall for gallon sales. Bulk in the final container size. Plants can be sown in January for quart sales.	9–10, 1 ppp	60–65°F (15–18°C)	Long Day Beneficial	5.8–6.2	1.25–1.75	50–75; or 150 as Needed	Average	Aphids, Whiteflies, <i>Pythium</i> , <i>Rhizoctonia</i>	Bonzi (S) 15 ppm Only if Necessary	Does not tolerate overly wet or overly dry growing conditions.

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Heuchera Marvelous Marble™ <i>Heuchera americana</i>	3–9	288	4–5	No Cover/ Light Cover	65–72°F (18–22°C)	64–68°F (18–20°C)	8–9	Not Required (Sold for Foliage)	NA	Transplant in late summer to early fall. Bulk in the final container size.	12–13, 1 ppp	65°F (15°C)	Day Neutral (Sold for Foliage)	5.8–6.2	1.25–1.75	50–75; or 150 as Needed	Average	Aphids, Whiteflies, <i>Pythium</i> , <i>Rhizoctonia</i>	Bonzi (S) 15 ppm Only if Necessary	Does not tolerate overly wet or overly dry growing conditions.
Iberis Tahoe™ <i>Iberis sempervirens</i>	3–9	288	3–4	Light Cover	60–65°F (15–18°C)	60–65°F (16–18°C)	7–8	Cold Required	8–10	Must bulk in the final container.	5–6, 2–3 ppp	60°F (15°C)	Day Neutral	5.5–6.2	1.25–1.75	50–75; or 150 as Needed	Dry–Average	<i>Botrytis</i> , Powdery Mildew	Florei (S) 250–500 ppm; Bonzi (S) 15 ppm Only if Necessary	Pinch at transplant in fall. Florei application in fall will improve branching and overall plant uniformity.
Lavandula Blue Scent™ <i>Lavandula angustifolia</i>	5–9	288	4–5	Light Cover	65–72°F (18–22°C)	65–72°F (18–22°C)	9–11	Not Required	NA	First-year flowering perennial. No vernalization needed.	8–12, 2–3 ppp	65–68°F (18–20°C)	Long Day Beneficial	5.8–6.2	1.25–1.75	50–75; or 150 as Needed	Average	Aphids, Whiteflies, <i>Phytophthora</i> , <i>Pythium</i>	Bonzi (S) 15 ppm	Improved winter hardiness versus other first-year flowering lavenders.
Lupinus Camelot™ <i>Lupinus polyphyllus</i>	4–8	128 or 72	128=2 72=3	Heavy Cover	65–72°F (18–22°C)	65–70°F (18–21°C)	128=6 72=8	Cold Beneficial	6–10	First-year flowering perennial. Vernalize large plugs for spring transplanting. Vernalized plugs provide more uniform flowering.	9–10, 1 ppp	65°F (15°C)	Long Day Required	5.8–6.4	1.5–2.0	75–100 ppm Nitrogen as Needed	Slightly Dry–Average	Aphids, Thrips, Whiteflies, Colletotrichum, Fusarium, <i>Rhizoctonia</i> , Rust	B-9 (S) 2500 ppm; B-9 (S) 2000 ppm + Sumagic (S) 3 ppm Tank Mix	Watch for foliar fungal diseases, especially at the beginning of bud set. Preventative sprays of Heritage will dramatically reduce disease incidence and improve profitability.
Lychnis Lely™ <i>Lychnis alphina</i>	4–8	288	2–3	Light Cover	65–72°F (18–22°C)	64–68°F (18–20°C)	6–7	Cold Required	6–10	Transplant in late summer to early fall.	8–9, 1–3 ppp	65–68°F (18–20°C)	Long Day Required	5.8–6.4	1.25–1.75	50–75; or 150 as Needed	Average	Aphids, Thrips, Whiteflies, <i>Botrytis</i> , Fungal Leaf Spot, <i>Pythium</i> , Rust	Bonzi (S) 15 ppm Only if Needed	Best used in small containers (4-inch to quarts) using 1 ppp. Plants have a relatively short bloom window. Good plant for rock gardens and low perennial borders.
Lychnis Lengai™ <i>Lychnis haageana</i>	6–8	288	2–3	Light Cover	65–72°F (18–22°C)	64–68°F (18–20°C)	6–7	Not Required	6–10	Can transplant in late summer to early fall for gallons or in March for quarts.	8–9, 1–3 ppp	65–68°F (18–20°C)	Long Day Required	5.8–6.4	1.25–1.75	50–75; or 150 as Needed	Average	Aphids, Thrips, Whiteflies, <i>Botrytis</i> , Fungal Leaf Spot, <i>Pythium</i> , Rust	Bonzi (S) 15 ppm Only if Needed	Best used in small containers (4-inch to quarts) using 1 ppp.
Papaver Spring Fever™ <i>Papaver nudicaule</i>	2–7	288	3	Light Cover	64–68°F (18–20°C)	60–65°F (16–18°C)	6–7	Cold Beneficial	6–9	Transplant in late summer to early fall. Bulk in the final container size.	6–7, 3 ppp	60–65°F (15–18°C)	Day Neutral	5.5–5.9	1.25–1.75	50–75; or 150 as Needed	Average	Aphids, Thrips, Spider Mites, Bacterial Blight, <i>Phytophthora</i> , Powdery Mildew, <i>Rhizoctonia</i>	Not Necessary	Growing under high light and cool growing temperatures improves overall quality.
Penstemon Pinacolada™ <i>Penstemon barbatus</i>	3–8	288	2–3	No	64–68°F (18–20°C)	60–64°F (16–18°C)	6–7	Not Required	NA	First-year flowering perennial. No need for bulking.	9–11, 3 ppp	65–70/55–60°F (18–21/13–15°C)	Day Neutral	5.8–6.2	1.5–2.0	75–125; or 150–200 as Needed	Average Early–Above Average Late	Aphids, Thrips, Powdery Mildew	B-9 (S) 2500 ppm or Bonzi (S) 15 ppm; Bonzi (D) 2–3 ppm.	Best used in small containers (4-inch to quarts) using 1 ppp. Sensitive to high salts. If not vernalizing, then plants should receive long days to hasten flowering.
Primula Confetti™ new <i>Primula denticulata</i>	5–8	288	2–3	Light Cover	62–68°F (17–20°C)	64–68°F (18–20°C)	7–8	Cold Required	5–8	Bulk in the fall. Leaves generally drop during vernalization.	6–7, 1–3 ppp	50–55°F (10–13°C)	Day Neutral	5.5–6.0	<1.2	75–100 ppm Nitrogen as Needed	Average	Aphids, Whiteflies, <i>Botrytis</i> on Flowers, <i>Pythium</i> , <i>Rhizoctonia</i>	B-9 (S) 2500 ppm or Sumagic (S) 3 ppm as Needed	Best used in small containers (4-inch to quarts) using 1 ppp. Sensitive to high salts.
Primula Rosy™ new <i>Primula rosea</i>	5–8	288	2–3	Light Cover	62–68°F (17–20°C)	64–68°F (18–20°C)	7–8	Cold Required	5–8	Bulk in the fall.	6–7, 2–3 ppp	50–55°F (10–13°C)	Day Neutral	5.5–6.0	<1.2	75–100 ppm Nitrogen as Needed	Average	Aphids, Whiteflies, <i>Botrytis</i> on Flowers, <i>Pythium</i> , <i>Rhizoctonia</i>	B-9 (S) 2500 ppm or Sumagic (S) 3 ppm as Needed	Best used in small containers (4-inch to quarts) using 1 ppp. Sensitive to high salts.

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Primula Primadiente™ <i>Primula cortusoides</i>	5–11	288	2–3	Light Cover	62–68°F (17–20°C)	64–68°F (18–20°C)	7–8	Cold Required	5–8	Bulk in the fall.	8–12, 1–3 ppp	50–55°F (10–13°C)	Day Neutral	5.5–6.0	<1.2	75–100 ppm Nitrogen as Needed	Average	Aphids, Whitefly, <i>Botrytis</i> on Flowers, <i>Pythium</i> , <i>Rhizoctonia</i>	B-9 (S) 2500 ppm or Sumagic (S) 3 ppm as Needed	Best used in small containers (4-inch to quarts) using 1 ppp. Sensitive to high salts.
Primula Salvana™ <i>Primula capitata</i>	6–8	288	2–3	Light Cover	62–68°F (17–20°C)	64–68°F (18–20°C)	7–8	Cold Beneficial	5–8	First-year flowering perennial (mid-summer flowering). Transplant in late summer to early fall and vernalize for early spring sales.	8–12, 1–3 ppp	50–55°F (10–13°C)	Long Day Beneficial	5.5–6.0	<1.2	75–100 ppm Nitrogen as Needed	Average	Aphids, Whitefly, <i>Botrytis</i> on Flowers, <i>Pythium</i> , <i>Rhizoctonia</i>	B-9 (S) 2500 ppm or Sumagic (S) 3 ppm as Needed	Best used in small containers (4-inch to quarts) using 1 ppp. Sensitive to high salts.
Pulsatilla Pinwheel™ new <i>Pulsatilla vulgaris</i>	4–8	288	2	Cover	64–68°F (18–20°C)	60–65°F (16–18°C)	8–9	Cold Required	6–10	Bulk in the fall.	8–9, 1–3 ppp	60–65°F (15–18°C)	Day Neutral	5.8–6.4	1.25–1.75	50–75; or 150 as Needed	Average	Aphids, Whiteflies	Usually Not Needed	Striking cup-shaped blooms.
Salvia Merleau® <i>Salvia x superba</i>	4–8	288	2	No—Light Required for Germination	68–75°F (20–24°C)	65–70°F (18–21°C)	5–6	Not Required	NA	Bulk in the fall.	7–8, 1–3 ppp	65–68°F (18–20°C)	Long Day Beneficial	5.6–6.2	1.5–2.0	75–100; or 150–200 as Needed	Average	Aphids, Spider Mites, Whiteflies, <i>Rhizoctonia</i>	B-9 (S) 2500 ppm	They do not tolerate overly wet growing conditions.
Saxifraga Highlander™ <i>Saxifraga arendsii</i>	5–9	288	1–2	Cover	68–72°F (20–22°C)	64–68°F (18–20°C)	9–10	Cold Required	9–12	First-year flowering perennial. No vernalization needed. Will flower earlier in spring if vernalized.	6–7, 2–3 ppp	63°F (17°C)	Day Neutral	5.8–6.4	1.25–1.75	50–75; or 150 as Needed	Slightly Dry—Average	Aphids, <i>Botrytis</i> , Powdery Mildew, Rust	Usually Not Needed	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.
Sedum Sea Star <i>Sedum pulchellum</i>	6–9	288	4–5	No—Light Required for Germination	65–72°F (18–22°C)	65–70°F (18–21°C)	7–8	Not Required	NA	Transplant in late summer to early fall for early spring sales.	7–9, 2–3 ppp	65–68°F (18–20°C)	Long Day Required	6.0–6.5	1.5–2.0	75–100; or 150–200 as Needed	Dry—Average	Aphids, Whiteflies, Powdery Mildew	Bonzi (S) 15 ppm Only if Necessary	Best used in small containers (4-inch to quarts) using 1 ppp. Too high of temperatures will give an uneven flowering response.
Sedum Silver Frost™ <i>Sedum nevi</i>	6–10	288	4–5	No—Light Required for Germination	65–72°F (18–22°C)	65–70°F (18–21°C)	7–8	Not Required	NA	First-year summer flowering perennial. No vernalization needed. Will flower earlier if vernalized.	7–9, 2–3 ppp	65–68°F (18–20°C)	Long Day Required	6.0–6.5	1.5–2.0	75–100; or 150–200 as Needed	Dry—Average	Aphids, Whiteflies, Powdery Mildew	Bonzi (S) 15 ppm Only if Necessary	Best used in small containers (4-inch to quarts) using 1 ppp.

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vegetative perennials guidelines and schedules

	Propagation Guidelines							Cold Treatment—Vernalization			Finished Guidelines And Schedules			Cultural Guidelines						
Species	Hardiness (USDA Zone)	Plug Size	Rooting Temp.	Temperature After Rooted	Rooting Hormone	Pinch in Prop.	Rooting Time (wks)	Cold Requirement	Duration (wks)	Comments	Finish Time (wks)	Temperature (Day/Night)	Photoperiod (Day Length)	Media pH	Media EC (mS/cm) SME	Fertilizer Rate (ppm N)	Irrigation Requirements	Insects & Diseases	PGR (S) Spray (D) Drench	
Achillea Gypsy® <i>Achillea ptarmica</i>	5–10	72–128	70–72°F (21–22°C)	64–68°F (18–20°C)	No	Optional	4–6, 1 ppp	Not Required	NA	First-year flowering perennial. No vernalization needed. Root and finish in spring.	9–11, 1–2 ppp	65–68°F (18–20°C)	Long Day Beneficial	5.8–6.4	1.5–2.0	150–200; or 250 as Needed	Average Early–Above Average Late	Aphids, Powdery Mildew	B-9 (S) 2500 ppm or Bonzi (D) 0.5–1.0 ppm	Pinch at transplant to encourage branching. Plants use a lot of water when they reach maturity. Producing them under long days will hasten flowering.
Aubrieta Axcent™ <i>Aubrieta hybrida</i>	4–9	72–128	70–72°F (21–22°C)	64–68°F (18–20°C)	Optional	No	5–7, 1 ppp	Cold Required	6–8	Bulking in the final container size is recommended before vernalization.	6–8, 1–2 ppp	60–65°F (15–18°C)	Day Neutral	5.5–6.5	1.25–1.75	50–75; or 150 as Needed	Average	Aphids, Botrytis, Pythium, Rhizoctonia	B-9 (S) 2500 ppm	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.
Gaillardia Sunburst™ <i>Gaillardia aristata</i>	3–10	72–128	72–75°F (22–24°C)	65–68°F (18–20°C)	No	Disbud flowers only	4–6, 1 ppp	Not Required	NA	First-year flowering perennial. No vernalization needed. Root and finish in spring.	8–10, 1 ppp	65–68°F (18–20°C)	Day Neutral	5.8–6.8	1.5–2.0	150–200; or 250 as Needed	Slightly Dry–Average	Aphids, Pythium, Smut	Bonzi (S) 20 ppm or Bonzi (D) 3–4 ppm. Best to manage irrigation and avoid excess nutrient levels.	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.
Gaura Geyser™ <i>Gaura lindheimeri</i>	5–9	72–128	64–68°F (18–20°C)	60–64°F (15–18°C)	No	Yes	5–7, 1 ppp	Not Required	NA	First-year flowering perennial. No vernalization needed. Root and finish in spring.	7–9, 2 ppp	65–68°F (18–20°C)	Long Day Beneficial	5.6–6.4	1.25–1.75	50–75; or 150 as Needed	Average	Aphids, Whiteflies, Pythium	B-9 (S) 2500 ppm or Bonzi (S) 15 ppm	Good plant to use in combination plants to add height and motion.
Lavandula Aromatico™ <i>Lavandula angustifolia</i>	4–9	72–128	70–72°F (21–22°C)	64–68°F (18–20°C)	Optional	Optional	4–6, 1 ppp	Not Required	NA	First-year flowering perennial. No vernalization needed. Root and finish in spring.	8–9, 1–2 ppp	65–68°F (18–20°C)	Long Day Beneficial	6.2–6.8	1.25–1.75	50–75; or 150 as Needed	Average	Aphids, Whiteflies, Phytophthora, Pythium	Bonzi (S) 15 ppm	Leaves and flowers have a sweet lavender fragrance. Watch pH and keep above 6.2.
Penstemon Phoenix™ <i>Penstemon hartwegii</i>	7–11	72–128	70–72°F (21–22°C)	64–68°F (18–20°C)	No	Yes	4–6, 1 ppp	Not Required	NA	First-year flowering perennial. No vernalization needed. Root and finish in spring.	10–12, 1–2 ppp	65–68°F (18–20°C)	Day Neutral	5.8–6.2	2.0–2.5	100–125; or 200–250 as Needed	Average Early–Above Average Late	Aphids, Thrips, Basal Stem Rot, Powdery Mildew	B-9 (S) 2500 ppm; B-9 (S) 2500 ppm + Cycocel (S) 1000 ppm; Sumagic (S) 5–10 ppm	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.
Phlox <i>Phlox subulata</i>	2–9	72–128	70–72°F (21–22°C)	64–68°F (18–20°C)	Optional	Yes	6–7, 2 ppp or 8; 1 ppp (2 pinches)	Cold Required	7–9	Bulking in the final container size is recommended before vernalization. Plants should be bulked a minimum of 8 weeks before vernalization.	6–8, 1–2 ppp	60–65°F (15–18°C)	Long Day Required	5.8–6.4	1.25–1.75	50–75; or 150 as Needed	Average	Aphids, Spider Mites, Whiteflies, Botrytis, Downy Mildew, Thielaviopsis, Fungal Root Rot	B-9 (S) 2500 ppm + Cycocel (S) 1000 ppm tank mix	Pinch at transplant to encourage branching. Pinch as needed during finished to shape plant. Use clean implements and good sanitation when pinching.
Phlox Peacock™ <i>Phlox paniculata</i>	4–8	72–128	70–72°F (21–22°C)	64–68°F (18–20°C)	Optional	Optional	5–6, 1 ppp	Cold Beneficial	6–10	First-year flowering perennial. No vernalization needed. Will flower earlier and more uniformly if vernalized.	10–12, 1–2 ppp	65–68°F (18–20°C)	Long Day Required	5.8–6.4	1.5–2.0	75–100; or 150–200 as Needed	Average	Aphids, Spider Mites, Thrips, Whiteflies, Cercospora Leaf Spot, Powdery Mildew	Bonzi (D) 3–4 ppm or B-9 (S) 2500 ppm + Sumagic (S) 5 ppm tank mix	Watch for powdery mildew. Peacocks have been bred for improved powdery mildew resistance. Violet and White are exceptionally strong performers.
Salvia Bordeau™ <i>Salvia nemorosa</i>	4–8	72–128	70–72°F (21–22°C)	64–68°F (18–20°C)	Yes	No	5–6, 1 ppp	Not Required	NA	First-year flowering perennial. No vernalization needed. Root and finish in spring.	7–9, 1–2 ppp	60–65°F (15–18°C)	Long Day Beneficial	5.6–6.2	1.5–2.0	75–100; or 150–200 as Needed	Average	Aphids, Spider Mites, Thrips, Whiteflies, Rhizoctonia, Thielaviopsis	B-9 (S) 2500 ppm	They do not tolerate overly wet growing conditions.

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vegetative perennials guidelines and schedules

Species	Propagation Guidelines							Cold Treatment—Vernalization			Finished Guidelines And Schedules			Cultural Guidelines						
	Hardiness (USDA Zone)	Plug Size	Rooting Temp.	Temperature After Rooted	Rooting Hormone	Pinch in Prop.	Rooting Time (wks)	Cold Requirement	Duration (wks)	Comments	Finish Time (wks)	Temperature (Day/Night)	Photoperiod (Day Length)	Media pH	Media EC (mS/cm) SME	Fertilizer Rate (ppm N)	Irrigation Requirements	Insects & Diseases	PGR (S) Spray (D) Drench	
Saxifraga Touran™ Saxifraga arendsii	3–7	72–128	70–72°F (21–22°C)	64–68°F (18–20°C)	Optional	No	6–8, 1 ppp	Cold Required	9–12	Bulking in the final container size is recommended before vernalization.	5–7, 1–2 ppp	60–65°F (15–18°C)	Day Neutral	5.8–6.4	1.25–1.75	50–75; or 150 as Needed	Slightly Dry–Average	Aphids, <i>Botrytis</i> , Powdery Mildew, Rust	Usually Not Needed	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.
Thymus Lemon King new Thymus citriodorus	5–8	72–128	70–72°F (21–22°C)	64–68°F (18–20°C)	No	Optional	5–7, 1 ppp	Not Required	NA	First-year flowering perennial. No vernalization needed. Will flower earlier and more uniformly if vernalized.	8–10, 2 ppp	65–68°F (18–20°C)	Long Day Required (for Flowering)	5.8–6.4	1.25–1.75	50–75; or 150 as Needed	Slightly Dry–Average	<i>Botrytis</i> , <i>Pythium</i> , <i>Rhizoctonia</i>	Usually Not Needed	They do not tolerate overly wet growing conditions.

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