SunPatiens®

Culture Guide

March 2026

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About SunPatiens®

SunPatiens® are a revolutionary new hybrid impatiens bred by Sakata. These remarkable plants represent a breakthrough in flower breeding: vigorous, sun–loving, heat–loving impatiens that thrive in full sun or part shade and deliver continuous color from spring through frost. Whether used in baskets, window boxes, patio pots or in the landscape, these beautiful varieties combine massive flower power with tough, low-maintenance plants. While SunPatiens® have a proven reputation for outstanding performance in the garden and commercial landscapes, their impressive features are not limited to outdoor displays. Growers will find SunPatiens® are extremely easy to produce and can be very profitable.

SunPatiens® Deliver Value

- An aggressive root system allows growers the option to direct stick into finished containers up to 5-inch (12.5-cm) pots saving time, labor, and money
- SunPatiens root extremely fast and produce finished liners in just 2 weeks
- Reduced crop time uses less energy and yields more turns in the same space
- SunPatiens grow well over a wide temperature range providing flexibility with production scheduling
- Plants can be finished under cool conditions with petunias and geraniums, saving energy and eliminating the need for PGR's
- SunPatiens flourish under the most extreme summer heat conditions and can extend your selling season
- Your customers benefit from their full-sun to shade versatility, strong vigor and continuous flower production
- Strong weather tolerant plants provide three–season performance, from spring through hard frost

SunPatiens® Family

SunPatiens® are offered in a wide array of colors and three distinct habits to address the specific needs of your production and target market. The first step in producing a high quality, successful crop is to select the varieties that best meet your production goals.

Compact Series

Compact SunPatiens® are bred for shorter internodes and excellent branching for a dense, bushy plant and strong retail appeal. Available in seven colors, the Compact SunPatiens® are the perfect choice for quart, gallon and hanging basket production. Compact varieties do not require growth regulator applications if plants are not grown wet with high nutrition and produced under high light.

Vigorous Series

With our Vigorous SunPatiens, the name says if all! The perfect plant where fast growing color is essential. While most commonly produced in larger containers, these plants cover a lot of bare ground fast and can be offered as 60-70mm "ready-to-plant" liners. This package provides quick turns for the grower and is ideal for the commercial landscaper and home gardener looking to save labor and simplify planting.

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Propagation

Rooting Material

Select a sterile, porous and well-aerated material for optimum rooting. Good aeration is important for preventing soft rots such as Pythium and Rhizoctonia and allows for more controlled growth during the later stages of propagation. Foam, peat, rockwool and media blends with 30-40% aggregate are all good choices. Because SunPatiens develop strong root systems quickly, direct sticking into the final container is a common practice. For direct stick production, use similar misting and light levels as outlined below for rooting liners. Regardless of the rooting method, target the media pH between 5.8 and 6.2 and the EC at 0.26 mmhos/cm (1:2) / 0.76 (SME).

Cuttings

When cuttings arrive, inspect them immediately by opening the box in a shaded sterile area to avoid exposing cuttings to insects. Cuttings can be held overnight in a cool, shady area or refrigerator at 45-50°F/7-10°C. If leaving overnight, open the box and allow the cuttings breathe and prevent moisture build up. Do not expose the cuttings to temperatures below 45°F/7°C, or higher than 60°F/16°C.

SunPatiens cutting, ready for sticking

SunPatiens cutting with callus

Stage One: sticking to callus

Stick cuttings into a pre-moistened rooting medium. SunPatiens root easily and do not require a rooting hormone. Submerging the cuttings into a 5 gallon/20 liter bucket filled with water and a capful of chlorine bleach prior to sticking is an option to sanitize. To reduce leaf surface tension and maximize water delivery to freshly stuck cuttings, apply a spreader sticker to the cuttings a day following sticking. CapSil 30 adjuvant works well at 3-4 ounces per 100 gallons/24-32 ml/100 liters, to reduce stress from transport and sticking. Follow all label directions.

SunPatiens root best at a media temperature between 68-75°F/20-24°C. Optimum light level for propagating SunPatiens is 1,500-2,000 foot candles/ 16,000-22,000 lux. Mist moderately the first three days and then apply mist only as needed to keep the cuttings turgid. By day 7 the cuttings should have formed callus.

Note: SunPatiens can be propagated at cooler temperatures, (63ºF/17ºC) however this can add 7-10 days to the propagation cycle.

Alternatively, SunPatiens can be successfully rooted without a mist system by covering the cuttings with two layers of remay/argyle (fiber spun fabric/fleece) and keeping the fabric wet throughout the day until roots form.

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Stage 2: Root Emergence

Once roots start to emerge, raise the light level to 3,000-3,500 foot candles/32,000-38,000 lux to speed development and prevent stretching. Target a day and night temperature of 68°F/20°C with a two-hour morning temperature drop, (5-7°F/2-3°C) beginning at dawn. Maintaining as close to a 0° DIF (difference between the day and night temperature) as possible with morning temperature drop reduces stretching and promotes compact cuttings.

When roots form, apply 75 ppm nitrogen from a well-balanced calcium nitrate-based formulation to strengthen the plants and enable them to tolerate higher light levels. EC target 0.26 mmhos/cm / 0.76 (SME) mmhos/cm.

SunPatiens cutting with root emergence

Stage 3: Bulking

Once roots have formed, allow the plants to dry down somewhat between irrigations. Keeping the media too wet promotes a hydroponic root that is less able to supply the plant with water and nutrients once transplanted into containers.

With proper water-restrictions, optimum light and recommended temperatures, use of PGR's may not be required; especially when rooting the Compact SunPatiens series. However, if necessary the use of chemical growth retardants is an option. To avoid over regulation, it is best to make foliar applications of more forgiving products with short term control. B-Nine/Alar/Dazide (daminozide), Cycocel (chlormequat) or tank mixes of the two are the best options.

Spray Rate	B-Nine (daminozide)	Cycocel (chlormequat)	B-Nine/Cycocel Tank Mix*	A-Rest (ancymidol)
Low Rate	1,250 ppm	750 ppm	1,000 / 500 ppm	1 ppm
High Rate	2,500 ppm	1,500 ppm	1,500 / 750 ppm	2 ppm

***A tank mix is more potent and reduces the risk of phytotoxicity from the Cycocel.**

Growing Tip: Research has shown that applying drought stress early in production delays flowering whereas later in production it does not affect timing. Therefore, if control of plant vigor is needed, use chemical plant growth regulators early in the production cycle. Then, use water restriction later in the production cycle as late applications of chemical growth regulators may delay flowering and reduce flower size.

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Stage 4: toning

SunPatiens root quickly and should be ready for transplanting in 2-3 weeks from sticking, for smaller cavity sized trays (144/128) and 3-4 weeks for large cavities (98/72). Reduce fertilizer and allow the plants to dry down between watering to tone and prepare them for transplanting. Do not delay transplanting as SunPatiens are strong growers and undesirable stretching will occur.

SunPatiens cutting, showing strong root development

SunPatiens in 3-inch/ 70mm Fertiss Landscape Liner

Diseases - Propagation:

Botrytis cinerea (gray mold) can be a problem if dead tissue is allowed to remain in the propagation area. Provide good air movement and employ strict sanitation procedures, removing any damaged cuttings or dead tissue. Botrytis is discussed in more detail later in this culture guide.

Rhizoctonia solani (fungal root rot) is a natural fungus that causes diseases such as damping-off, root rot, crown rot, stem cankers, and web blight. *Rhizoctonia* is a main concern for growers who direct stick SunPatiens into larger containers or use poorly aerated media. The fungus characteristically grows across the top of the soil to attack the stem base. Keep hose-ends off floors as *Rhizoctonia* can persist in dirt and debris on concrete floors. Fungus gnats and shore flies may also introduce and spread this fungus within a crop. Biological and chemical methods are available for controlling these insects. Sanitation is always the first defense against *Rhizoctonia*. Use sterile, soil-less growing medium, clean pots and flats, and keep field soil away from propagation areas. If preventative drenches are necessary, select those labeled as safe for use on New Guinea Impatiens. Fungicides with active ingredients such as thiophanate-methyl 3336, 6672 (Banrot), strobilurins (Heritage, Compass, Insignia), and PCNB (Terraclor) are effective in combatting *Rhizoctonia*. Biofungicides containing Trichoderma or Bacillus subtilis, are also helpful in fighting this pathogen.

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New Guinea Impatiens infected with *Rhizoctonia*

Pythium irregulare is a water mold that may also attack SunPatiens through the roots or cutting wound. Symptoms of *Rhizoctonia* and *Pythium* look similar. If there is an obvious black stem, with wide or narrow black stripes, then *Pythium* is the most likely cause. Please note that black discoloration further up the stem may be an indication INSV (Impatiens Necrotic Spot Virus). Another obvious sign of *Pythium* infection is a black discoloration of the vascular tissue inside a cut stem, (easily seen by looking at the stem base). This discoloration may also be seen inside the largest roots. Being a water mold, *Pythium* is controlled by different chemicals than *Rhizoctonia*. Chemicals with the active ingredient etridiazole (Truban, Terrazole/Banrot) are highly effective against *Pythium irregulare. Pythium* is not always impacted by the chemical methoxyacetyl (SubdueMAXX) so always rotate it with products that have a different mode of action. Biological controls for *Pythium* are forthcoming and offer possible alternatives to chemicals.

Myrothecium roridum is a fungal leaf spot disease that causes lesions, with irregular or circular pattern. Handle cuttings gently to prevent tissue damage which serve as entry points for inoculation. Look for sporulation on the leaf underside to distinguish from INSV. SunPatiens are resistant to *Myrothecium*, but if necessary, control with Chlorothalonil (Daconil) or Azoxystrobin (Heritage).

Pythium irregulare and Botrytis are discussed in more detail later in this culture guide.

Insects:

Fungus gnats and shore flies can be a problem if algae are present in the propagation area, on floors, walls and/or benches. Heavy infestations of fungus gnats and shore flies can negatively affect rooting and quality. Eliminate algae and weeds by thoroughly scrubbing the propagation area with bleach and eliminating standing water.

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Transplanting

Media

SunPatiens do best in a media that is well-aerated. High porosity mixes, such as those made from coarse/ long fiber peat moss or short fiber peat moss blended with 30-40% aggregate work very well. For containers that will not be re-transplanted, such as hanging baskets or large patio pots, a media with higher water holding capacity is desirable for consumers. Optimum pH for SunPatiens is 5.8 to 6.2 with a starting EC less than 0.5 mmhos/cm (1:2) / 1.4 (SME). **Avoid a pH below 5.8 which can induce iron and manganese toxicity.**

Containers

SunPatiens work well in a wide range of containers. Use the chart below as a guide.

Container Size	Number of Cuttings	SunPatiens Category
Multi-packs (growing tip below)	**1**	Compact (direct stick)
4 inch/10 cm.	**1**	Compact (direct stick)
5 inch/12 cm.	**1**	Compact
6 inch/15 cm.	**1**	Compact
8 inch/20 cm.	**1**	Compact, Vigorous
10-12 inch/25-30 cm. (baskets)	**1* or 3**	Compact
16 inch/40 cm.	**3**	Vigorous
16 inch/40 cm.	**4**	Compact

*allow 2-3 weeks of additional crop time

Growing Tip: For multi-packs start with a small unrooted cutting with small leaves. Begin toning right after callus and rooting begins. Target 65-75 ppm N using a calcium nitrate-based fertilizer. Do not allow plants to become soft or allow excess leaf expansion. Provide high light and a lot of *tough love*, to force flowers on small plants.

70 mm ellepot production is ideal for landscapers or planting mixed containers
Direct stick and target 8 weeks.

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Temperature

Initially, maintain 65-70°F/18-21°C in the root zone to establish the crop. Then, once the plants are fully rooted and the canopy begins to fill in, the temperature may be lowered to 55-60°F/13-16°C to save energy or control growth. Maintain as close to a 0° DIF (little variance between day and night temperature) as possible with a 5-7°F/2-3°C temperature drop for 2 hours beginning at dawn to produce compact plants and limit internode stretch.

SunPatiens perform well and set buds over a wide range of temperatures, from 55-85°F/13-29°C. Research by Dr. James Faust, (Clemson University, South Carolina), researched the effects of temperature on flower size, timing and plant height. Dr. Faust found that cooler temperatures yield a more compact plant with larger flower size, but time to flower increases by 2-3 weeks. Plants grown at warmer temperatures flower earlier, (up to one week), but are taller with smaller flowers.

Average Temperature	60°F/16°C	70°F/21°C	80°F/27°C
Flower Size	Increases	Average	Decreases
Time to Flower	Increases	Average	Decreases
Plant Height	Decreases	Average	Increases

Light Level

Provide 3,500 – 5,000 foot candles/38,000-54,000 lux and a DLI (daily light integral) of 10 moles for strong growth. Lower light levels promote tall, leggy plants and should be avoided. SunPatiens may be produced outdoors in full sun if acclimated for one week at 5,000 foot candles/54,000 lux. Under higher light levels the plants may require more frequent watering and care to prevent excess wilting. *For high quality finish and increased retail sell-through, high light is especially critical for successful high-density or multi-pack (306) production.*

Growing Tip: Plants that are subject to excess shading (<3,500 foot candles/38,000 lux) from overhead basket lines will flower later, produce less flowers and grow taller.

Supplemental Lighting

SunPatiens are day-length neutral. However, in areas with limited winter and early spring sunlight, (Northern Europe, Canada, New England, Great Lakes and Pacific Northwest), supplemental lighting up to 14 hours a day may be highly beneficial for increasing the amount of flowers. Target a daily light integral up to 10 moles.

Watering

Perhaps nothing is more important for producing high quality SunPatiens than irrigation practices. To establish a quality plant with a strong root system, be careful not to initially over-saturate the media. In addition, allow it the media to dry down in between irrigations to promote root growth. *Watering early in the day is best; especially if watering overhead, as cold water applied to warm foliage causes leaf burn.* Waiting until the plants show a slight wilt before watering promotes a strong root system and increases uptake of calcium for strong, healthy stems and leaves. Keeping the media constantly moist or over-watered will result in tall, leggy plants with weak stems and will require more frequent applications of PGR's.

It is also important to note that while NGI's are susceptible to bud abortion when subjected to wilt, SunPatiens are much more tolerant and will rebound quickly if allowed to dry down. Under low relative humidity, some leaf scorching may occur if plants are subjected to severe wilt, however this is uncommon under most greenhouse conditions.

SunPatiens grown under the same light, temperature, and fertilizer levels illustrate the impact water restriction can have on finished plant quality.

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Fertilizer

Initially, allow the plants to root out prior to fertilizing (usually 2 weeks after transplanting). Then fertilize as needed with 65-100 ppm* nitrogen, or as needed to maintain a media EC of 0.5 mmhos/cm (1:2) / 1.4 (SME). In general, SunPatiens are moderate feeders, similar to traditional New Guinea Impatiens. Limit applications of ammonium to less than 5 ppm, as high ammonium rates cause softer tissue and taller stems. Cal/Mag formulations such as 15-5-15 and 17-5-15 work well to supply valuable calcium and magnesium in areas where water levels are low in these macroelements.

Container Size	Nitrogen Rate
4-8 inch / 10-20 cm.	**100 ppm Nitrogen**
10-16 inch / 25-40 cm., Hanging Baskets	**100 ppm Nitrogen**

Microelements

In pre-mixed fertilizers the level of microelements supplied is directly related to the nitrogen rate. At 100 ppm N, most commercial fertilizer will supply enough microelements except for boron. Fertilizer manufacturers target 200 ppm N as being standard so applying less than 200 ppm N (100 ppm) results in lower than optimal amounts of boron. An optimum range of microelements is:

Fe - 0.5 ppm	Mn - 0.25 ppm	ZN - 0.25 ppm	B - 0.25 ppm	Cu - 0.05 ppm	Mo - 0.05 ppm

Therefore, supplement as needed based on the amount of trace elements in the water source and or media. The goal is to target iron (Fe) at 0.5 ppm and boron at 0.25 ppm in the nutrient solution.

Additional fertilizer tips

Do not apply fertilizer during the heat of the day or when plants are drought-stressed. Periodic fresh water, (no fertilizer), irrigations may be needed in areas where salinity is a concern.

Incorporating a slow release fertilizer into the media, such as 18-6-12 may compliment a liquid fertilizer program when accelerated growth is needed,

If the soluble salt levels are high, >0.5 mmhos/cm. (1:2), >1.4 mmhos/cm (SME), leach with fresh water. The following symptoms are indicative of excess soluble salts:

- Upper leaf crinkling or waffling
- Marginal leaf burn
- Less plant growth
- Restriction of upper root growth (sub-irrigated plants)
- pH – Low pH (<5.5) increases the risk of iron and manganese toxicity, characterized by purplish-black spotting of lower leaves.
- High pH (>6.3) increases the risk of iron deficiency characterized by interveinal chlorosis of the newly formed leaves. Iron is an immobile element and symptoms will spread to the lower foliage if the pH is not corrected.

Magnesium is a macro element and often undersupplied in commercial fertilizer mixes. Magnesium is a mobile element, so a deficiency shows as chlorosis of the lower leaves. If not corrected, chlorosis will lead to necrosis. Magnesium deficiency is easily corrected by adding MgSO4 (Epsom Salts) to the fertilizer. Brian Whipker PhD., of North Carolina State University, recommends supplying between 25-50 ppm Mg in the fertilizer solution for New Guinea Impatiens.

	Amount of MgSO4	PPM Magnesium /Sulfur
Per 100 gallons (USA)	**1 ounce (by weight)**	**7.5 ppm Mg / 10.5 ppm S**
Per 1,000 liters	**75 grams**	**7.5 ppm Mg / 10.5 ppm S**

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Grower Tip: Although visual symptoms are helpful, periodic testing of the substrate by a certified lab is the best way to manage pH and plant nutrition.

Potassium, Calcium and Magnesium Balance:

A recommended ratio of Potassium, Calcium and Magnesium for SunPatiens is 4: 2: 1. Below is a chart outlining how to supply this ratio using single element fertilizers. Growers should target this balance based on an analysis of their irrigation water and substrate testing.

4: 2: 1	KNO3 (38% K)* Potassium Nitrate	CaNO3 (19% Ca) Calcium Nitrate	MgSO4** (10% Mg) Magnesium Sulfate	Total N – K –Ca – Mg
Per 100 gallons (USA)	4.9 ounces	4.3 ounces	4.7 ounces	**100-140-70-35**
Per 1,000 liters	368 grams	322 grams	350 grams	**100-140-70-35**

actual percentage of K as the bag lists the percentage as K_2O, which is potassium oxide and not actual K

****cannot be tank mixed with calcium nitrate due to precipitation***

Phosphorous

Phosphorous is a mobile element and the general recommendation for New Guinea Impatiens is to supply 8-10 ppm at each fertilization. Higher phosphorous rates promote luxuriant growth. When phosphorus is deficient, the lower leaves take on a reddish-purple color. Growers who use mineral acid to neutralize alkalinity may need to use a combination of phosphoric and sulfuric acids to avoid oversupplying phosphorus. 20-10-20, is popular with many North American growers, may be alternated with 15-5-15 to maintain optimum pH. Please note that 20-10-20 does not supply calcium and at 100 ppm N contains 22 ppm (parts per million) of phosphorus.

Grower Tip: When plants are grown at a temperature below 47°F/8°C phosphorus uptake is reduced and lower leaves may become reddish-purple, even though phosphorus is not lacking in the substrate.

Spacing

Initially, keep plants pot tight and then space when leaves begin to touch neighboring plants. Failure to space on time results in stretched plants with thin stems.

Pot Size	Space Recommendation
4 inch/10 cm.	**6-7 in./15-18 cm. on center**
5 inch/12 cm.	**7-8 in./18-20 cm. on center**
6 inch/15 cm.	**9-10 in./22-25 cm. on center**
8 inch/20 cm.	**10-12 in./25-30 cm. on center**
10 inch/25 cm.	**12-14 in./30-35 cm. on center**
12 inch/30 cm.	**14-18 in./35-45 cm. on center**
Hanging Baskets	**16-18 in./40-45 cm. on center**

Pinching

SunPatiens should NOT be pinched as this alters the plant's natural symmetry. Cultural (restricting water uptake) and chemical controls are much better options

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Plant Growth Regulation

Ideally, proper scheduling and cultural controls will yield plants with a toned and compact habit. High light and water management are critical to controlling plant height. The best method for minimizing stretch under high density conditions is to use PGR's early in the crop cycle, and then use culture controls (moisture stress and high light during the finish cycle. Avoid subjecting the plants to a severe wilt which causes flowers to drop (although flower buds are still retained). Below are some common culture controls to use with SunPatiens.

Cultural Control	Method
High Light	> 3,500 foot candles / 38,000 lux
Water Stress	Allow plants to wilt slightly prior to watering
Low temperature	50-55°F / 10-13°C (once established)
Spacing on time	See chart under spacing

Chemical Plant Growth Regulation (foliar applications)

For finished production, foliar sprays with A-Rest (ancymidol) works best to avoid over regulation for improved consumer satisfaction.

Chemical Control	A-Rest*	SunPatiens Varieties
Low Rate	2 ppm	Compact types
High Rate	4 ppm	Vigorous types

*Multiple spray applications may be necessary towards the end of the crop to achieve the desired plant habit. **A tank mix of B-Nine/A-Rest** provides greater control. Rates range from 1,500 – 2,500 B-Nine and 2 – 4 ppm A-Rest.

Grower Tip: Combining drought stress with chemical growth regulation can lead to plants that are "too compact" or stunted. Therefore, target B-Nine/A-Rest foliar applications at the lower rate if combining with moisture reduction to avoid over regulation. The use of paclobutrazol (Bonzi) is not recommended.

Finished Plant Growth Regulation (drench applications)

For hanging baskets, where foliar applications are impractical, use the following guide. As mentioned earlier, it is best to make two applications at a lower rate to avoid overregulation; especially since hanging baskets are often watered after a slight wilt is noticed.

Chemical Control	A-Rest Drench Rates	SunPatiens Varieties
Low Rate	0.1 ppm	Compact types
High Rate	0.2 ppm	Vigorous types

Low Phosphorus to Control plant Growth

Growers may also use lower phosphorus rates to control plant growth. The amount of phosphorus applied to the plant has more influence on plant growth and stretching than the form of nitrogen (nitrate vs. ammonium). The following photo illustrates this point.

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Compact Royal Magenta treated as follows:

Left to right:

Control – No treatment

A-Rest – 2 ppm spray 2 x

Low P – 5 ppm Phosphorus

B-Nine/Bonzi – 1,000 ppm B-Nine / 2 ppm Bonzi tank mix spray 2 x

Disease

SunPatiens have been shown to be both disease and insect resistant in both the greenhouse and outdoors. Growers should however keep an eye out for two diseases that can occasionally affect SunPatiens, *Botrytis cinerea* (gray mold) and *Pythium irregulare*.

Botrytis cinerea is mainly an issue when high humidity and decaying tissue are both present. Only five hours of a water film (such as that caused by condensation) are needed for infection to take place if temperatures are between 64-77°F/18 -25°C. *Botrytis* blight is likely to attack flower petals so plants in flower or those growing underneath lines of flowering hanging baskets are most at risk. The spots caused by *Botrytis* are large and irregular with tan to brown areas. *Botrytis* is also a concern when plants are not spaced properly to allow sufficient light penetration and air circulation. The lack of light causes lower leaves to senesce which then serve as hosts for inoculation.

Sanitation and environmental control are the best tools for keeping *Botrytis* in check. Remove all dead or dying plants or plant parts, and lower humidity levels. Water overhead early in the day to prevent prolonged periods of leaf wetness. It is important not to leave open containers of plant debris in the greenhouse. Heat and vent to reduce excess humidity and provide good air movement to prevent water condensation on leaves. Products containing the active ingredients fenhexamid (Decree), iprodione (Chipco 26019), chlorothalonil (Daconil), and copper (Phyton 27, Kocide) are good options in managing this disease. Please note that chlorothalonil and coppers may damage open flowers. Biological include *Streptomyces* (Actinovate), *Bacillus* (Cease), and *Trichoderma* (Plant Shield).

Symptoms of INSV look similar to those of *Botrytis* but usually there are some leaves that show blackening.

Pythium irregulare

In the production of SunPatiens, *Pythium* will often attack a plant with a compromised root system, (stressed either from high salts or excess moisture). It starts by attacking juvenile tissues such as the root tip. After gaining entrance to the root the fungus may cause a rapid, black rot of the entire primary root and may even move up into the stem tissue. As the soil dries, new roots may be produced and the plant may recover or never show symptoms of disease. The pathogens that are responsible for *Pythium* root rot, also known as water mold, are present in practically all cultivated soils and attack plant roots under wet conditions. These fungi can be spread by fungus gnats and shore flies. Soil moisture conditions of 70% or higher are conducive to infection by *Pythium*. Good sanitation and moisture management are the first line of defense against this water mold. Chemical control options are listed in the Disease section under Propagation.

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Insects

The three major greenhouse insect pests of concern are fungus gnat, spider mite and thrips. Some of the information below is gleaned from Raymond Cloyd's article on insects that appears in the Sakata Gerbera Manual.

Fungus Gnats

Fungus gnats (*Bradysia* spp.) can be a problem when growing SunPatiens for several reasons. First, large populations of adults flying around may affect crop salability. Second, both the adult and larval stages are capable of disseminating and transmitting diseases. Third, larvae cause direct plant injury to roots and create wounds that may allow secondary soil-borne pathogens to enter.

Fungus gnat adults live for 7-10 days and females deposit 100 to 200 eggs into the cracks and crevices of the growing medium. A characteristic diagnostic feature of fungus gnat larvae is the presence of a black head capsule. Larvae are generally located within the top 2.5 to 5.0-cm of the growing medium. However, they can also be found in the bottom of containers near drainage holes. The life cycle, from egg to adult, can be completed in 20 to 28 days, depending on temperature.

Proper sanitation such as removing weeds, old plant material, and old growing medium can reduce fungus gnat populations. Weeds growing underneath benches create a moist environment that is conducive for fungus gnat development. Hand pulling or employing herbicides will kill existing weeds. Most importantly, eliminate the build-up of algae. Avoid excess watering and over fertilization of plants as this leads to conditions that promote algae growth. Keep floors, benches, and cooling pads free of algae by using a disinfectant containing quaternary ammonium salts. Insecticides combined with algae control works best to control populations. Options include conventional insecticides (adults) insect growth regulators (larval stage) and microbially-based insecticides applied as drenches or "sprenches" to control larvae.

Biological control is another option to manage fungus gnats when growing SunPatiens. Biological control agents or natural enemies that are effective in controlling fungus gnats are the beneficial nematode, *Steinernema feltiae*, the soil-predatory mite, *Hypoaspis miles*, and the rove beetle, *Atheta coriaria*. All three biological control agents attack fungus gnat larvae. They can be applied to the growing medium or soil in the floor. They need to be applied early before fungus gnat population's build-up.

Two-spotted Spider Mite

Two-spotted spider mite (*Tetranychus urticae*) is most often located on the older leaves of SunPatiens. They feed on leaf undersides within plant cells removing plant cell contents. They generally feed near the midrib and plant veins although they will feed on the entire leaf. Damaged leaves appear stippled with small silvery-gray to yellowish speckles. Leaves heavily infested with mites may appear bronzed, turn brown, and fall off. The mites may also spin irregular webbing, which allows them to move among plants; especially when SunPatiens are spaced close together and leaves are in contact with each other. Mites may also be carried on wind currents or via crop handling, and prefer warm, dry conditions with low relative humidity.

Two-spotted spider mite is approximately 1.6-mm long, and oval shaped. They vary in color from greenish yellow to reddish orange. The adult females possess distinct black spots located on both sides of the body. Adult females live about 30 days and can lay up to 200 small, spherical, transparent eggs on leaf undersides. The life cycle from egg to adult takes 1 to 2 weeks, depending on temperature. For example, the life cycle from egg to adult takes 14 days at 70°F/21°C and seven days at 90°F/29°C.

Management generally involves combining cultural practices with the use of miticides. Cultural practices that may be helpful in controlling populations are listed below.

1) Avoid over fertilizing SunPatiens; especially with ammonium, as this results in the production of soft, succulent tissue that is easier for twospotted spider mite to penetrate with their mouthparts.
2) Remove "old" plant material, which may serve as an inoculum source for mites for subsequent crops.
3) Avoid over stressing the plants with water (too dry) because this increases susceptibility to attack.
4) Remove weeds from within and around greenhouses because weeds (including the nightshades and creeping woodsorrel) are hosts for twospotted spider mite.

If insecticides are needed, thorough coverage of all plant parts, especially the underside of leaves, is essential. Products with translaminar activity, that enable the chemical (after foliar application) to move from the top of the leaf surface to the bottom, work well. Insecticidal soaps may be phytotoxic, and read the label to determine on which mite life stages each material works best.

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It is extremely important to rotate miticides or insecticide/miticides with different modes of action in order to reduce the possibility of mite populations developing resistance. Greenhouse producers should only use a material once or twice during a generation (depending on the time of year) then switch to another material with a different mode of action.

A rare sight, Spider Mite damage on a SunPatiens Hanging Basket due to insufficient watering

Western Flower Thrips (WFT)

Western flower thrips (*Frankliniella occidentalis*) feeding on SunPatiens leaves results in leaf scarring, necrotic spotting, distorted growth, and sunken tissues (primarily on leaf undersides). Damage to flowers or un-opened buds may result in flower bud abortion or deformation of flowers.

Western flower thrips are slender, small insects approximately 2.0 mm in length with fringed or hairy wings. They may vary in color from yellow-brown to dark brown. Adult females insert eggs into leaves. They can lay up to 250 eggs during their 45 day lifespan. Eggs hatch into nymphs that feed on leaves and flowers. Western flower thrips will pupate in flowers, leaf litter, or growing media. Adults that emerge from the pupae stage typically feed on flowers. The life cycle, from egg to adult, takes approximately three weeks to complete and is dependent on temperature.

Sanitation practices such as removing weeds, old plant material debris, and growing medium debris will minimize problems with WFT. Remove plant material debris from the greenhouse or place into containers with tight-sealing lids. Screening greenhouse openings such as vents and sidewalls will prevent WFT from entering greenhouses from outside. The appropriate screen size or mesh for WFT is 192 microns (132-mesh).

The principal management strategy is to apply insecticides when populations are “low,” which avoids dealing with different age structures or life stages—eggs, nymphs, pupae, and adults—simultaneously over an extended time period. Contact insecticides or those with translaminar activity are generally used to control WFT, because systemic insecticides typically don’t move within flower parts (petals and sepals) where WFT adults normally feed. Treating early, prior to insects entering the terminal or flower buds, is critical as treating open flowers is risky and may lead to damage. High-volume sprays are typically used to kill WFT that are located in hidden areas of plants such as un-opened flower buds.

Three to five applications within a 7 to 10 day period may be needed when WFT populations are “high” and there are different life stages present or overlapping generations. Frequency of application depends on the time of year (season), as during cooler temperatures the life cycle is extended compared to warmer temperatures, which will influence the number of applications required.

The primary way to prevent or minimize the potential of WFT populations from developing resistance and prolong the effectiveness of currently-available insecticides is to rotate insecticides with different modes of action. In general, rotate different modes of action every two to three weeks or within a generation. However, this depends on the time of year since the development rate of the life cycle is temperature dependent.

Biological control of WFT relies on using natural enemies such as predatory mites (Neoseiulus or Amblyseius spp), minute pirate bugs (Orius spp.), and entomopathogenic fungi (Beauveria bassiana). However, the key to implementing a successful biological control program against WFT is to release natural enemies early enough in the cropping cycle. Releases must be initiated prior to WFT entering terminal or flower buds. Natural enemies will not control an already established or existing “high” WFT population, because it takes time from initial release before natural enemies will lower WFT numbers below damaging levels

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Virus diseases

All SunPatiens cuttings are produced from mother stock that has been established from elite cultures that have been repeatedly indexed for a wide range of possible virus diseases. Although SunPatiens do not seem to be particularly sensitive or susceptible to plant virus diseases, it is important to be aware of virus infections that could occur and damage the crop.

Tospovirus (INSV, TSWV)
The tospovirus group of virus diseases includes Tomato Spotted Wilt Virus (TSWV) and Impatiens Necrotic Spot Virus (INSV), both of which can occur in commercial greenhouse operations, and both have a very broad host range. With standard New Guinea Impatiens, tospovirus symptoms include concentric ringspots on the foliage, blackening of the stems, stunting and necrosis. In severe cases, tospovirus infection can lead to the demise of the plants; furthermore, infected plants can serve as inoculum for further spread of the disease to other crops

Tospovirus is spread by Western Flower Thrips (see above); larvae that feed on infected tissue grow into adults that can infect other plants through their feeding activity. Hence, stringent thrips control is paramount in preventing this disease.

Cucumber Mosaic Virus (CMV)
In standard New Guinea Impatiens, infection with Cucumber Mosaic Virus results in narrow, rugose foliage with strongly serrated leaf edges; the leaf surface is often irregular, and the flowers are strangely “windmill-shaped”, ie the petals become narrower and twisted. Furthermore, CMV infection can decidedly stunt the growth of standard NGIs, but is rarely fatal. Although CMV infection has not been diagnosed on SunPatiens to date, it is expected that SunPatiens can indeed serve as a host and develop similar symptoms.

CMV is mainly transmitted by aphids, but can also be transferred by mechanical means, eg through plant sap on cutting knives or the likes. Controlling aphid infestations on a preventive basis is the best method to prevent CMV infection.

Other virus diseases that could possibly infect SunPatiens are Tobacco Streak Virus (TSV) and members of the Potyvirus group but are rarely encountered.

2020-21 SunPatiens Attributes

Variety	Timing	Bloom Size	Vigor	Height*	Width*
Compact Blush Pink	Early	Large	Slightly Higher	18-32” / 45-80 cm	14-24” / 35-60 cm
Compact Bright Purple	Early	Large	Average	16-30” / 40-75 cm	14-24” / 35-60 cm
Compact Classic White	Early	Large	Average	16-30” / 40-75 cm	14-24” / 35-60 cm
Compact Coral Pink	Early	Large	Average	16-30” / 40-75 cm	14-24” / 35-60 cm
Compact Deep Red	Early	Large	Average	16-30” / 40-75 cm	14-24” / 35-60 cm
Compact Deep Rose	Very Early	Large	Lower	12-24” / 30-60 cm	12-20” / 30-50 cm
Compact Electric Orange	Very Early	Slightly Smaller	Lower	12-24” / 30-60 cm	12-20” / 30-50 cm
Compact Hot Coral	Very Early	Large	Average	14-28” / 35-70 cm	14-24” / 35-60 cm
Compact Hot Pink	Early	Slightly Smaller	Average	16-30” / 40-75 cm	14-20” / 35-50 cm
Compact Lavender	Early	Large	Average	16-30” / 40-75 cm	14-20” / 35-50 cm
Compact Lavender Splash	Early	Large	Average	16-30” / 40-75 cm	14-24” / 35-60 cm
Compact Lilac Improved	Early	Large	Average	16-30” / 40-75 cm	14-24” / 35-60 cm
Compact Orchid Blush	Early	Large	Slightly Higher	18-32” / 45-80 cm	14-24” / 35-60 cm
Compact Pink Flash	Early	Medium	Average	16-30” / 40-75 cm	14-24” / 35-60 cm
Compact Purple Candy Imp.	Very Early	Large	Average	16-30” / 40-75 cm	14-24” / 35-60 cm
Compact Red	Early	Large	Lower	12-24” / 30-60 cm	12-20” / 30-50 cm
Compact Red Candy	Early	Large	Average	16-30” / 40-75 cm	14-24” / 35-60 cm
Compact Rose Glow	Early	Large	Slightly Higher	18-32” / 45-80 cm	14-24” / 35-60 cm
Compact Royal Magenta	Early	Large	Average	16-30” / 40-75 cm	14-24” / 35-60 cm

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Compact Scarlet Orange	Early	Large	Slightly Higher	18-32” / 45-80 cm	14-24” / 35-60 cm
Compact Tropical Rose	Slightly Later	Large	Slightly Higher	18-32” / 45-80 cm	14-24” / 35-60 cm
Variety	**Timing**	**Bloom Size**	**Vigor**	**Height***	**Width***
Vigorous Lavender Splash	Early	Large	Average	18-34” / 45-85 cm	24-36” / 60-90 cm
Vigorous Orange Imp.	Early	Slightly Smaller	Average	18-34” / 45-85 cm	24-36” / 60-90 cm
Vigorous Orchid	Early	Large	Average	18-34” / 45-85 cm	24-36” / 60-90 cm
Vigorous Peach Candy	Early	Large	Average	18-34” / 45-85 cm	24-36” / 60-90 cm
Vigorous Pink Kiss	Early	Large	Average	18-34” / 45-85 cm	24-36” / 60-90 cm
Vigorous Pretty Pink	Early	Large	Slightly Lower	18-32” / 45-80 cm	24-32” / 60-80 cm
Vigorous Purple	Early	Large	Average	18-34” / 45-85 cm	24-36” / 60-90 cm
Vigorous Red	Early	Large	Average	18-34” / 45-85 cm	24-36” / 60-90 cm
Vigorous Rose Pink	Early	Large	Slightly Higher	20-36” / 50-90 cm	24-36” / 60-90 cm
Vigorous Sweetheart White	Early	Large	Average	18-34” / 45-85 cm	24-36” / 60-90 cm
Vigorous Tropical Orange Imp.	Early	Medium	Average	18-34” / 45-85 cm	24-36” / 60-90 cm
Vigorous Tropical Salmon	Slightly Later	Medium	Slightly Lower	18-32” / 45-80 cm	22-32” / 55-80 cm
Vigorous Tropical White	Early	Slightly Smaller	Average	18-34” / 45-85 cm	24-36” / 60-90 cm
Vigorous White Improved	Early	Large	Average	18-34” / 45-85 cm	24-36” / 60-90 cm

SunPatiens grown under cooler (Northern) climates will be smaller than those grown with warmer night temperatures

Crop Schedule

SunPatiens flower based on a combination of light level and temperature. Please see the chart below for more details.

Pot Size	Liners per Pot / Cell	*Total Crop Time (Weeks)	Total Crop Time Direct Stick (Weeks)
306 / Jumbo Pack	**1**	**7-9 weeks**	**6-8 weeks**
Quart / 5-6 inch**	**1**	**8-10 weeks**	**7-9 weeks**
Gallon / 8 inch	**1**	**9-11 weeks**	**8-9 weeks**
10 inch / 25 cm	**1**	**11-13 weeks**	**10-11 weeks**
10 inch / 25 cm	**3**	**9-11 weeks**	**8-10 weeks**
12 inch / 30 cm	**3**	**10-13 weeks**	**9-11 weeks**

*** From a 2 ¼ inch/5 ½ cm liner at 70°F/21°C average temperature. Southern regions with higher light and temperatures will flower earlier.**

****Compact varieties only – requires more aggressive growth regulation**

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Consumer Care

SunPatiens do best in raised beds where the soil is well aerated and rich in organic matter. Incorporate slow release fertilizer prior to planting and water sufficiently to establish the bed. Once established, SunPatiens are fairly drought tolerant. In heavier soils, consider using Vigorous types as they are better at tolerating less than ideal conditions. SunPatiens tolerate lower soil temperatures (55°F/13C) and can be planted earlier than many other heat-loving annuals, like vinca. This is a key advantage for landscapers who need plants to perform and look good over a long growing season.

Nematodes

Nematodes are simple roundworms which are colorless, un-segmented, and lacking appendages. Nematodes may be free-living, predaceous, or parasitic. Many of the parasitic species cause important diseases of plants. Other species are beneficial in attacking insect pests, mostly sterilizing or otherwise debilitating their hosts. Nematodes are more problematic in warmer climates with higher soil temperatures and lack long periods of below freezing temperatures. Root Knot Nematodes may attack SunPatiens causing plant stunting. Crop rotation is a good strategy to reduce insect pressure. A parasitic nematode Steinernema feltiae is a particularly effective against the immature stages of Root Knot Nematodes. Nematode Steinernema feltiae is also effective in parasitizing Root Ring and Sting Nematodes and is usually applied to soil as a drench.

Spreading Variegated White infected with Root Knot Nematodes

(Left) New Guinea Impatiens (Right) SunPatiens Root systems from nematode-infected soil showing how SunPatiens are better able to resist nematodes.

Garden Height and Width Guide

SunPatiens Class	Plant Height	Plant Width
Compact Series	16 to 32 inches / 40 to 80 cm.	14 to 24 inches / 35 to 60 cm.
Spreading Series	20 to 36 inches / 50 to 90 cm.	24 to 36 inches / 60 to 90 cm.
Vigorous Series	24 to 48 inches / 60 to 120 cm.	24 to 30 inches / 60 to 75 cm.

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