

CULTURAL TIPS

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Cultural Check List by: Ron Adams

"I want to give you some check lists that you can do before your plants arrive, when they arrive, and after planting to help you have a successful growing season."

THINGS TO KEEP IN MIND BEFORE THE PLANTS ARRIVE:

Have materials ready for planting when the plants arrive. Any delays causing you to hold the plants can decrease their vigor and ability to establish.

Have the greenhouse checked to assure that the heating and ventilating systems are properly functioning. Have there been any changes in or around the greenhouses? New parking lot lights that stay on at night can affect photo periods.

Test the water and soil and make sure that the fertilizer will balance the plants nutritional needs.

Have sufficient labor to handle the crops when they arrive.

Have a receiving area for the plants that will allow you to unpack them and inspect them on arrival. This is commonly a headhouse. It should provide sufficient conditions so as not to cause plant stress such as too hot or too bright. I always like to see warm conditions 65-70°F. with about 30-35% shade. Water the plants if dry. Vernalized perennials can be kept at 38-40° F. prior to planting.

Have a place to keep the shipping documents, to make notes on plant conditions when the plants arrive.

THINGS TO DO WHEN PLANTS ARRIVE:

Unpack and inspect all of the plants received. Place plants in the receiving area after unpacking prior to planting.

Make notes of any visible problems such as damaged leaves, cold/frost injury, off color leaves, and any disease. Look especially at the growing points. If the growing points are not damaged most often the plants can establish and develop normally from shipping damages. Check the roots for any damage with cold injury. Look for hitchhiking insects.

Plant plugs and liners within 24 hours. Often it is best to allow the plugs and liners to recover from shipping overnight. If the plants arrive early in the day then they can be transplanted the same day. Do not plant dry plugs or liners. Water them first. Planting dry plugs slows root development. Normally you should see the roots establish in 5-7 days after transplanting.

Make sure that the transplanted plugs and liners are watered in immediately after transplanting to settle the soil and establish contact with the root-ball.

Do not plant the plugs or liners too deep since most plants should not have their crowns planted deeper than the original plug or liner. Marigolds and tomatoes are typically the exception.

Salvia needs to be established under at least 35% shade for the first 5-7 days after transplanting to prevent tip abortion.

Tuberous begonias need at least a 14 hour day length to prevent tubers from forming, which would slow down development.

THINGS TO DO AFTER TRANSPLANTING THE PLUGS AND LINERS:

Place plants into the proper environment. Remember, if you only have one growing area, try to match conditions within the area such as hot, cold, and light or shade. Monitor temperatures. You should have 65-68° F soil temperatures until the newly transplanted seedlings/liners start to develop.

Check for root development. New roots should establish 5-7 days after transplanting. If the roots are not taking off, check the growing conditions. If the roots are not developing and showing a dark/black color then a fungicide drench might be required.

You should not have to fertilize most crops until they have started to establish.

Establish a scouting program to routinely monitor the crops. This will allow you to take corrective action immediately should a problem occur. Noticing a problem but waiting to act can decrease your ability to correct the problem and save your crop. A good example is the use of yellow sticky traps to identify pest problems when they first arrive. Yellow sticky traps are good for identifying whitefly, winged aphids, leafminer adults, thrips, fungus gnats, and moths. They will not show spider mites, so you have to inspect the plant leaves.

Scout for stressed plants (wilting on bright days after watering), off color foliage, poor root development, brown or black roots, stems and leaf spots, flowers not forming on schedule.

Watering methods should minimize the amount of leaf wetness on the plants after watering. The plant foliage should dry within 2-3 hours after watering. Watering late in the day can keep the leaves wet for too long allowing botrytis and mildews to establish. High humidity in the greenhouse at the end of the day allows moisture to form on the leaves allowing disease to establish. Ventilate and heat to lower the relative humidity at the end of the day.

HOW DO YOU DIAGNOSE A PLANT PROBLEM?

You need a good visual image of how the plant looks compared to how a healthy plant at the same stage of development should look. How is it different from a healthy plant in the same area? If the whole area is affected, how should they look?

What are the symptoms; such as leaf or stem spots, different color, wilting leaves, poor or dead roots? Look at the plant roots first to determine if they are developing normally. After checking the roots, then look at the stems and leaves. The growing points are critical so try to determine if they are affected. If a problem is observed then look at the plants around them to see if other plants are showing the same symptoms.

After checking the plants, look at the growing environment. Is there a physical problem, such as sitting too close to a heater, or too close to an open vent. I have seen plants show cold injury coming from a door that was not tightly sealed. Are the heaters working properly? Is there a leak in the irrigation system keeping the plants too wet? Is there too much shade or something overhead?

After checking the greenhouse environment conditions go back to the plant to see if there is a cultural problem. Are the plants planted too deep, or is the soil too compact and not draining properly? Have they been fertilized when too dry? Is it too much light, or not a long enough day length? Is there poor air movement which would slow drying and keep the plants too wet? Is your fertilizer rate what it should be? A poorly working fertilizer injector typically underfeeds the calculated rate.

If you observe a growing problem, call as soon as it is noticed to minimize the problem and find corrective action. We want to help you succeed.

OTHER IDEAS:

Educate yourself. Many good books are available or subscribe to industry e-mails and magazines.. Seminars at OFA and other trade shows are a great learning opportunity. Growing quality plants takes a lot of good hard work, but remember - success doesn't cost, it pays!

Ron Adams is on our team to help you with cultural advice. With more than 30 years in the industry and lots of hands-on experience, Ron adds another level to our "Reliable Service."

Help avoid costly losses by tapping into his expert advice. If you would like to speak with him regarding any products you have purchased from Jolly Farmer, please give your rep a call. It is our hope that through this service you will become more successful.

INTRODUCTION: An annual is a plant that completes its life cycle in one year. A biannual is a plant that completes its life cycle in two years and a perennial is a plant that grows over a number of years but does not always flower the first year from seed. Plant cycles can be shortened through propagation techniques. A good example is geraniums. A geranium grown from seed requires accumulating light energy units to bloom. A cutting geranium already has that accumulated light and will keep developing buds during the rooting cycle. Handling live plants is always a situational experience. The biggest situation can be shipping since it disrupts the plant from its continuous growth cycle. Healthy developing plants have their day-night temperature, water, and light, as well as their atmosphere conditions interrupted when placed on racks or boxed and shipped. Since you are receiving plants that have had a break in their growing cycle you will need to restart the growing process. Restarting the plants and finishing them are often two separate events that get grouped into one process at planting. Here are some frequently asked questions that we receive from customers on starting and finishing their Jolly Farmer plugs and rooted liners.

1. What are the conditions that affect the plants during shipping?

Too hot, too cold, too wet, and too dry are factors that affect the plants during shipping. We try our best to provide the best moisture in the trays prior to racking or boxing but the shipping conditions or the delivery systems can vary, affecting the plants conditions on arrival. Getting the plants out of the boxes and off the racks onto a bench on arrival reduces the stress of shipping. Greenhouse conditions should not be stressful. A moderate temperature of 62-65 degrees and some overhead shade allows the plants to acclimate and recover from shipping. Water dry plants and allow wet plants to dry down overnight prior to planting to help the plugs and cuttings recover from the shipping stress.

2. How can I tell if the plugs and cuttings are taking off as expected?

The best way to monitor the plants is to check the roots. Most newly planted plugs and cuttings should have root initials growing into the new media within 3-5 days after transplanting. New roots should be visible at the sides and bottom of the container within 10-14 days after transplanting.

3. If the plants are not taking off after transplanting what should I do to get them back on track? Check the conditions if it is too hot or cold, then adjust the conditions. It usually helps to water everything in thoroughly again to help the roots move out of the cutting or plug soil.

4. How do I handle damaged plants on arrival?

Call your Jolly Farmer representative and let them know the problem. Next, assess the damage to determine if the plants need extra treatment, such as a fungicide and note if the growing tips are affected. Most of the time, planting will allow the plants to recover from the damage, and you can see in a week how the plants are progressing.

5. What and when should I feed the cuttings and plugs? - See specifics in this culture guide.

Fertilizer formulas can be very specific and depending on your water and media, specialized formulation might be required. We do not suggest retail formulations of fertilizer or 20-20-20 since they tend to have too much ammonium, and phosphorus for balanced plant growth. A good rule of thumb is never feed a plant under water stress (wilted). First water the plant with clear water, then you can feed after the plant has recovered from the stress.

6. Do I need to pinch my plants?

This question often depends on the plant and its growth development. Some crops such as geraniums have historically been pinched 3 weeks after planting to keep the plant short and increase the number of breaks. New plant varieties have reduced the need for pinching in many cases. Sometimes plants are pinched to shape and fill out hanging baskets. A well fed plant should not need a lot of additional pinching.

7. What is the difference between a hard pinch and a soft pinch?

A hard pinch takes out the stem and 1 or more internodes on the plant. A soft pinch will just remove the growing point at the tip of the plant.

8. What causes geraniums cuttings to have lower yellow leaves?

Often when geraniums are shipped, there is a high ethylene level in the box that results in lower yellow leaves. This typically goes away after transplanting. Some lower leaf yellowing can be a result of low feeding levels in which case you would also see a reddish color to the leaf. Check the roots and if they are fine, then increase the feeding levels to green the plants.

9. What causes some plants to take off and root out initially and others take longer to establish in the same tray?

If you plant dry plugs or dry rooted cuttings, the plants might not root out initially. Make sure that the plugs and cuttings have ample moisture in their root ball prior to planting.

10. Why should you check the root system of the plant?

The root development determines how the plant is progressing. Plants need a well developed root system to provide moisture and nutrients to the plant. A poor root system allows the plant to become easily stressed decreasing its ability to develop on time. Damaged roots can be a result of moisture stress, either too wet or too dry, or fertilizer damage. Often damaged roots allow disease infections to establish. If you see damaged roots determine the cause of the damage and treat with an appropriate fungicide.

11. Why are growth regulators used in production of rooted cuttings and plugs?

The main reason is to promote a uniformly developed plant in a confined space. Plants need to have a balanced root-to-shoot ratio and appropriate plant growth regulators are used to produce quality plugs or rooted cuttings.

12. Can I grow my plants cool to save on heating costs?

What you should think of is not cool growing but cool finish. To successfully finish the crops, you need to get the roots established 14-21 days prior to lowering the temperatures. Not all crops should be finished cool such as impatiens, vinca, begonias and pentas. Just remember with a cool crop, times are longer, so consider your bench space. What some growers do is purchase larger plug and cutting sizes which decreases the finish time, saving heat by growing when the weather is warmer. Plants that work well for cool finish are: snapdragons, petunias, geraniums, marigolds, calibrachoa and bacopa.

13. How do I control diseases such as botrytis and mildew?

Most of these foliar diseases develop because of wet leaves and flowers. Try to keep leaf wetness to less than 2 hours. This is best accomplished by proper venting of the greenhouses. Often moisture develops on the plants at the end of the day, especially on bright days. As the temperature drops, the relative humidity rises to the dew point, resulting in moisture on the plants. It is best to heat and ventilate for an hour at the end of the day by opening the vents and running the heaters to lower the relative humidity before closing the houses at night. Make sure that the air moves through the plant canopy. During cloudy, moist weather you will need to heat and ventilate throughout the day to keep the relative humidity down. If you cannot environmentally control the leaf wetness, then a fungicide is required.

14. How can I reduce plant stretch without using plant growth regulators?

Plants are programmed to stretch by the difference of day/night temperatures. When we have greater than 10°F of positive difference between day/night temperatures, you will have more internodal plant stretch. Keeping the day/night temperatures to less than 10°F difference is the best way to reduce stretch. Using a negative day/night temperature difference will also keep the plants from stretching. Growers may also lower the temperature 10°F at sunrise for 2 hours which also slows down rapid plant growth. Increasing container size or giving the plants more space also helps keep plant stretch down. Fertilizer choices also can play a role in decreasing plant stretch. High ammonium levels with high phosphate levels increases plant stretch while calcium and potassium-based fertilizers provide better plant tone.

15. How can I control heat in the greenhouse?

Shading is the best way to control the high temperatures. Using a 30% shade cloth will reduce temperatures to allow for optimum plant development. Shade compounds sprayed on the greenhouses will also lower the heat build up inside. It is best to put the shade on the outside of the greenhouse for cooling.

Fertilizers... working with slow release fertilizers

by: Ron Adams

Having worked with slow-release fertilizers for over forty years, I have experienced both the benefits as well as the potential problems of applying this form of fertilizer to ornamental crops. Remember that most slow-release fertilizers are coated soluble fertilizers that can be incorporated into the soil medium prior to planting or top dressed onto the soil after planting. You can produce high quality plants correctly using slow-release fertilizers.

What is a slow-release fertilizer?

For the purpose of this discussion I will define it as one of the various commercial fertilizers available through the horticulture products distribution. There are several brands of slow-release fertilizer. The most commonly available product is resin coated soluble fertilizers. They are available in different formulations and can vary in release from 3-4 months to formulations that can take 18-24 months to release. Formulations can also vary in the nutrient content with different fertilizers that can include minor elements.

Reasons for using slow-release fertilizers:

1. Feeds the plants without having to apply soluble fertilizers directly or through an injector.
2. Can feed the plants after they leave the production location.
3. Works in combination with soluble fertilizers to provide a consistent level of nutrients for the plants to draw on.

Limitations of using slow-release fertilizers:

1. Fertilizer release rates vary by formulation and temperature.
2. Once the release has started you cannot stop the release of fertilizer. It is only possible to slow it down with cooler temperatures.
3. Fertilizer pellets can be fractured during mixing, making all of the fertilizer available at once.
4. Difficult to leach out high levels of soluble salts in slow growing plants.
5. Can cause severe plant damage when applied too close to the plant stem.
6. Can cause lush plant growth with unseasonably high temperatures, requiring PGR to control the plant habit.

How to use Slow-release fertilizers:

1. Follow label guidelines and recommendations for use.
2. Soil incorporation prior to planting can uniformly disperse the fertilizer, reducing the risk of root or plant injury from concentrating the fertilizer in one spot. Carefully blend the slow-release into the growing medium so as not to fracture the pellets. If incorporating into the soil, do not apply extra water prior to planting, so the fertilizer release is not initiated.
3. If you choose to top dress, do so after the roots are reaching to the sides or bottoms of the container so that the fertilizer does not concentrate around newly initiated roots. Top dress application should be applied to the soil surface so as not to concentrate the fertilizer at the base of the plants.
4. Select the formulation and application method that works best for your operation and not based on what others are doing.

Using Plug Sizes... to your Best Advantage

by: Peter Darrow – Sales Manager

Choosing the right plug size can be a somewhat bewildering job, so I've put together some ideas to help you make the decision that is right for your business. First, let's look at the different options, what they are useful for, and see how they can be meshed into your production program.

512's This is the smallest and most economical plug. It's great for cell pack production, but can also be used in 4" & 6" pots with multiple plants/pot. However, I would suggest the latter only during your better growing conditions since the larger soil volumes take longer to dry down.

288's These are usually 1 week more mature than the 512. They finish approximately 7-10 days faster than the 512, and since they have a larger root ball, they can survive the stress of transplanting more easily than a 512. The 288 also allows you to grow a greater selection of varieties without as much volume. Late in the season, you might even slip in an extra turn in your greenhouse using 288's for a faster finish.

144's We offer a complete line of bedding plants in this large plug. A multi-sown product (except certain items like vegetables, Gerberas, and other items you don't want multi-sown) this large plug is excellent for 4", 6" and larger pots or baskets. One 144 will fill out a 4" pot 7-10 days faster than a 288.

26's Available for premium-seed started items such as Wave petunias, Cannas, and other items. Suitable for quarts, gallons, or multiple plants in a 2 gallon.

I hope this helps you in your decision-making process,

Peter



512

288

144

26

Plugs shown proportionally to each other but not actual size.

Using Liner Sizes... to your Best Advantage

by: Peter Darrow - Sales Manager

Choosing the right size liner can be a somewhat bewildering job, so I've put together some ideas to help you make the decision that is right for your business. First, let's look at the different options, what they are useful for, and see how they can be meshed into your production program.

200's Our most economical cutting size. It's great for those who are prepared to plant right away - this product should not be held in the tray! If you've been rooting your own cuttings, consider letting us do that difficult part without hurting your pocketbook! The 200's usually have not been pinched - we do not want to check their growth by holding them too long in the tray. They are generally one week less mature than the 3-26 or 2-51, so allow an extra week of crop time. Tags included.

2-51 & 3-26 Our most popular sizes, with an extensive variety listing. These can be used in any size pot or basket with great success. They work well for mixed containers too, and with over 700 varieties to choose from, you'll have an outstanding selection. Tags included.

Peter



200



3-26

3 strips with 25 in each.

2-51

2 strips with 50 in each.



3-26

2-51

200

Cuttings shown proportionally to each other but not actual size.

Using Perennial Sizes... to your Best Advantage

by: Peter Darrow - Sales Manager

Choosing the right size perennial plug or liner can be a somewhat bewildering job, so I've put together some ideas to help you make the decision that is right for your business. First, let's look at the different options, what they are useful for, and see how they can be meshed into your production program.

288 plugs This is our most economical size. It is perfect for packs, such as 804's or 1801's that you can simply "bulk up" and sell green early in the season. You may even get some color on the first year blooming varieties. 288's are also superb for starting a summer crop that you intend to over-winter. Plant in July or early August (in Northern climates) to get them well established before winter.

144 plugs These plugs are larger and older than the 288, so can be used in larger pots. You could put these in 4", 6", or even gallon pots with 2-3 plants per pot depending upon the specie. This size also allows you to purchase only half the quantity per variety as the 288, so you can double your selection in the same space! They can also be used for starting summer crops, like the 288.

26 plugs A good size liner for 6" or larger pots. Use 2-3 plants if growing in 2 gallon pots. Remember - these are not vernalized. You'll see in our catalog those that we mark "first year bloomers" - do not count on the other items blooming the first year.

2-51 & 3-26 All our perennials that are not started from seed are grown in one of these two sizes. A good size liner for 6" or larger pots. Use 2-3 plants if growing in 2 gallon pots. Remember - these are not vernalized. You'll see in our catalog those that we mark "first year bloomers" - do not count on the other items blooming the first year. Tags included.

Bare Roots Lovely, bulky roots grown for us by a farm in Nova Scotia. We'd suggest these for 6" or larger pots - just one clump per pot. They will all bloom the first year, since they have been through at least one Canadian winter! Tags included.

Peter

Bare Root Plants



Hemerocallis Happy Returns - 1-2 fan



Hosta fortunei aureomarginata - 1-2 eye



Astilbe Red Sentinel - 3-5 eye

Planning
+ Work
= Profit

Let's look at some ideas for scheduling, using the various plug and liner sizes that we offer. Adapt these ideas to what best fits your operation.

by: Peter Darrow – Sales Manager

Calendar for Late Start-Up

(designed for the Northeast)

Early March

Plant May baskets using regular liners: add extra plants for faster finish.

Plant pansy flats. Use a 288 which will finish faster and provide a wider selection of colors.

Plant Osteospermum and Regal Geraniums. Use pre-cooled liners for early to mid-May sales.

Begin planting your specialty pots such as New Guineas and Scaevola and other slower growing items using 2-51's or 3-26's.

Late March

Plant bedding plant flats. Since your space is not full, use 512's whenever you are sure you can sell 500 of a color; or use a 288 where 500 is too much. Space out your labor needs by planting 512's first, and then a week later 288's.

Early April

Plant another crop of bedding plants to have fresh product after the first one is sold - provided you have the market!

Late April is the time to plant...re-crops! Space is starting to open up as you ship pansies and other early products. Use that space.

Re-crop flats using 288 plugs for a quick turn product that would be ready for late May.

Re-crop specialty pots for early June sales.

Re-crop hanging baskets for June sales. If you're really busy, consider our planting those products for you. We can deliver everything planted, tagged, and ready to lay out... what a relief! Keep your crew busy selling and shipping while we do the planting for you! (Sorry - only available in New England or in truckload lots outside New England.)

May is the time to: SELL! SELL! SELL!

Calendar for Low Input Cost with Longer Crop Times (designed for the Northeast)

Early January

Plant pansies and other cool crops. Use 512 plugs (since you have plenty of time and space). Get them established at warm temperatures before cooling them down and growing them slowly through the cold winter months.

Plant hanging baskets. Use 200 size cuttings (where available) and larger liners to start slower growing items (Fuchsias, Ivy Geraniums, Calibrachoa, Non-Stop Begonias, etc). If you opt to use fewer plants per pot to reduce input costs, you will need to allow for a longer crop time and additional pinching. Finish your basket planting by mid to late February.

Plant Osteospermum, Regal Geraniums (for Easter), and other cool-growing premium items.

Mid February

Plant specialty pots. Start with your longest crop time and smallest size plug or liner to reduce input costs.

Plant Regal Geraniums. Using pre-cooled liners for Mother's day sales (plant early March).

Mid March to early April

Plant bedding plant flats. Since your space is not full, use 512's whenever you are sure you can sell 500 of a color; or use a 288 where 500 is too much. Space out your labor needs by planting 512's first, and then a week later 288's. Continue planting for successive crops.

Late April is the time to plant...re-crops! Space is starting to open up as you ship pansies and other early products. Use that space.

Re-crop flats using 288 plugs for a quick turn product that would be ready for late May.

Re-crop specialty pots for early June sales.

Re-crop hanging baskets for June sales. If you're really busy, consider our planting those products for you. We can deliver everything planted, tagged, and ready to lay out...what a relief! Keep your crew busy selling and shipping while we do the planting for you! (Sorry - only available in New England or in truckload lots outside New England.)

May is the time to: SELL! SELL! SELL!

I hope these scenarios have helped spark your imagination about what you can do to make your business more profitable. There's no "one size fits all" solution, and these ideas are intended only as general guidelines. Our goal is to provide you with as many tools as possible to enhance your success. All the best for Spring!

Peter

GENERAL CULTURE SHEETS

Annuals

Note: ppp = plants per pot

“General Recommendations for Growing Packs”

TEMPERATURE: 55°-65° Nights.
65°-68° for first week helps some items get established

FERTILIZER: We recommend using something like a 13-2-13, at 100-150 ppm.
Constant feed depending on media or conditions.

GROWTH REGULATORS: Refer to manufacturer’s instructions.
Tip: a 5°-10°F negative “dip” early in the morning (just before it starts getting light), until 3 hours after sunrise, greatly helps to keep bedding plants short.

IMPORTANT...Always make sure your plugs and cuttings are well watered before transplanting.

Note: Concerning pansies and vinca...after transplanting do not fertilize or drench with chemicals until the roots start spreading...approximately 5-7 days.
Helps prevent Thielaviopsis.

SPECIES	GROW TIME (in weeks) Using 512's in packs, 288's in 4" pots, or 144's in 6" pots.	GROW TIME (in weeks) From 25 strip into 10" baskets	Special Notes
ABUTILON	8 - 9	—	Temps above 85°F may cause flower abortion.
AGERATUM	6 - 7	—	—
ALTERNANTHERA	4 - 5	—	Higher light results in deeper color. Do not use cycocel.
ALYSSUM	4 - 5	—	Feed heavily and spray routinely for downy mildew, bacterial leaf spot, and soft rot.
AMARANTHUS	4 - 6	—	—
ANGELONIA	8 - 10	—	Do not pinch. Keep light levels high.
ASTER	4 - 5	—	Sold green.
BACOPA	4 - 6	4 ppp = 11 - 13	Avoid overwatering or drought. Can be grown cool, but allow extra weeks of grow time.
BEGONIA	6 - 7	4 ppp = 7 - 8	Needs heat and high ammonium.
BEGONIA Gryphon	5 - 6 (for 4-5")	3-4 ppp = 7 - 9	Relatively disease and pest-free.
BEGONIA Wings	7 - 11 (for 4-6")	4-5 ppp = 9 - 11	Important to plant with leaves pointed outward to make a symmetrical basket.
BEGONIA Tuberous	9 - 11 (for 4-6")	4 ppp = 10 - 12	Provide at least 10 ftc of light from 10 pm to 2 am from October through February. Plant with leaves pointing outward.
BROWALLIA	5 - 6	4 ppp = 12 - 13	Sold green in packs. Pinch and use pgr's in baskets for best results.

☼ See specific Culture Sheet. Check “Contents” for page numbers.

SPECIES	GROW TIME (in weeks) Using 512's in packs, 288's in 4" pots, or 144's in 6" pots.	GROW TIME (in weeks) From 25 strip into 10" baskets	Special Notes
CALCEOLARIA	18 - 20 (for 4")	—	—
CALENDULA	4 - 5	—	Sold green.
CANNA	9 - 12 (for 4")	—	—
CELOSIA	5 - 6	—	Watch for alternaria.
CHRYSANTHEMUM	10 - 11	—	—
CINERARIA ☼	12 - 14 (for 4")	—	Grow cool for winter or early spring sales.
CLEOME	3 - 4	—	Sold green.
COLEUS	4 - 5	—	Spray routinely for downy mildew.
COSMOS	3 - 4	—	Sold green.
DAHLBERG DAISY	5 - 6	—	—
DAHLIA	7 - 8	—	Watch for downy mildew. Shear to encourage branching.
DIANTHUS	6 - 7	—	—
DIASCIA	6 - 8	—	—
DICHONDRA	5 - 6 (for 4")	—	—
DRACAENA	8 - 12 (for 4")	—	—
DUSTY MILLER	5 - 6	—	—
ERYSIMUM	7 - 9	—	—
EUCALYPTUS	10 - 12 (for 4")	—	Pinch for better branching.
EXACUM	8 - 10 (for 4")	—	Be sure to dry down to minimize disease issues.
FLOWERING CABBAGE & KALE	4 - 5	—	Colors up with cold temps and high light.
GAZANIA	7 - 8	—	—
GERBERA ☼	9 - 14 (for 144's in 4")	—	See specific culture sheet.
GLOXINIA	11 - 14 (for 4-6")	—	—
GOMPHRENA	5 - 6	—	—
GYPSOPHILA	5 - 6	4 ppp = 10 - 12	Cool temps enhance color.
HELIANTHUS	7 - 9 (for 4-6")	---	Use 4" pots only in winter, use larger pots for other seasons.
HELICHRYSUM	6 - 7	---	—
HYPOESTES	5 - 6	---	—
IMPATIENS	4 - 5	4 ppp = 6 - 8	Blitz makes impressively large baskets.
IMPATIENS semi-double	5 - 6	—	Slower to flower than regular impatiens.
IRELINE	5 - 6 (for 4")	5 ppp = 10 - 12	—
LAVATERA	8 - 10 (for 4-6")	—	—

SPECIES	GROW TIME (in weeks) Using 512's in packs, 288's in 4" pots, or 144's in 6" pots.	GROW TIME (in weeks) From 25 strip into 10" baskets	Special Notes
LEYCESTERIA	—	6	Pinch or trim 2 weeks after planting. Do not PGR.
LISIANTHUS	10 - 12	—	—
LOBELIA	5 - 6	—	—
MARACAS	10 - 14	—	—
MARIGOLD - AFRICAN	6 - 8	—	Requires short days to flower.
MARIGOLD - FRENCH	5 - 6	—	—
MELAMPODIUM	7 - 9	—	—
MESEMBRYANTHEMUM	4 - 5	—	Likes cooler temps, 60-70°F. Grow in sandy, well drained soil.
MIMULUS	8 - 9	—	Needs long days to bloom.
MIRABILIS	3 - 4 (for 4")	—	Easy and fast to grow, not recommended for packs. Vigorous.
N.G. IMPATIENS	8 - 10	—	Better for small pots.
NASTURTIUM	2-3 for packs	—	Vigorous and quick growing.
NICOTIANA	5 - 6	—	In bud.
NIEREMBERGIA	6	—	—
ORN. CORN	—	6	PGR similar to Orn. Millet. Requires high fertility. Root space determines plant height.
ORN. MILLET	7 - 9 (for 4-6")	—	Full sun darkens the leaf color.
ORN. MUSTARD	3 - 4	—	—
ORN. PEPPER	4 - 5	—	Sold green.
OSTEOSPERMUM	7 - 10 (for 4")	—	Hold plants at 50° for 2 weeks before transplant.
PANSY	6 - 7	—	Cooler temps make larger flowers. Watch roots for disease pressure such as thielaviopsis and phytopthera.
PANSY PLENTIFALL	4 - 6	144 or 25ct = 5-7 ppp, 7 - 10	Disease: Damping-off & Black root rot. Regular scouting for powdery mildew and preventative measures are recommended.
PENTAS	7 - 9	—	Needs high temperatures and high light.
PETUNIA	5 - 7	—	Make sure to give good dry down cycles to promote good roots, good connections, and avoid "runty" plants.
PETUNIA - DOUBLES	6 - 8	—	See note above.
PETUNIA-SPREADING	7 - 10	3 ppp = 8-12	See note above. Pinch once.
PHLOX	8 - 9	—	—
PLECTRANTHUS	9 - 10 (for 4")	—	—
PORTULACA	7 - 8	—	Loves heat.
PRIMULA ☼	8 - 12 (for 4")	—	Needs cold temps to set bud.

SPECIES	GROW TIME (in weeks) Using 512's in packs, 288's in 4" pots, or 144's in 6" pots.	GROW TIME (in weeks) From 25 strip into 10" baskets	Special Notes
PTILOTUS	7 - 9	—	Do not over-water.
RANUNCULUS ☼	12 - 15 (for 4")	—	See specific culture sheet.
RUELLIA	15 - 16	—	—
SALPIGLOSSIS	13 - 14	—	—
SALVIA COCCINEA	6 - 7 (for 6")	10-12	Heat lover. Ideal for Spring and Summer.
SALVIA FARINACEA	8 - 9	—	—
SALVIA PATENS	8 - 10 (for 4")	—	Very vigorous. Grow cool (55 - 60).
SALVIA SPLENDENS	5 - 6	—	Watch for downy mildew.
SEED GERANIUM ☼	10 - 12 (for 4")	—	—
SNAPDRAGON	6 - 7	—	Watch for botrytis (much better with single-sown plugs).
SPILANTHES	7 - 8	—	—
SPRENGERI	10 - 12 (for 4")	3-4 ppp = 18 - 20	Once established, feed every 2 weeks. Grows up to 6 ft fronds.
STOCK	6 - 10	—	Longer grow time is for cooler temps.
STRAWFLOWER	6 - 7	—	—
TALINUM	4 - 5	—	Sold green.
THUNBERGIA	4 - 5 (for 4")	—	Vining plant, not recommended in packs.
TITHONIA	6 - 10 (6" or larger)	—	Will need to ship before vines intertwine.
TORENIA	6 - 7	—	—
TRACHELIUM	9 - 11	—	—
VERBENA	7 - 8	—	Watch closely for downy mildew and powdery mildew. Keep warm and dry.
VINCA ☼	6 - 8	Use trailing varieties. 4-5 ppp = 15-20	Try Cora series for ease of growing. Keep warm and dry. Watch roots for disease pressure.
VIOLA	5 - 6	—	Thrives in cool temps. Day-length sensitive.
ZINNIA ☼	4 - 6	—	Spray routinely for rhizoctonia and bacterial leaf spot. Keep warm and dry. Try Profusions and Zaharas for ease of growing. See specific culture sheet.

☼ See specific Culture Sheet. Check "Contents" for page numbers.

Vegetables & Herbs

Note: ppp = plants per pot

SPECIES	GROW TIME (in weeks) From 512's to packs	GROW TIME (in weeks) From 288's or 25ct to 4" pots	GROW TIME (in weeks) From 144's or 25ct to baskets or patio pots	FERTILIZER	TEMPERATURE	SPECIAL TIPS
BROCCOLI BRUSSEL SPROUTS CABBAGE CABBAGE (CHINESE) CAULIFLOWER COLLARDS KALE	3-4 wks	1 ppp = 4	—	1-2 x per week with 50-75 ppm	50°F Night, 60°F Day	Keep soil dry and withhold feed to help control growth.
CELERY	3-4 wks	—	—	1-2 x per week with 50-75 ppm	50°F Night, 65°F Day	Do not dry out.
EGGPLANT	4-5 wks	1 ppp = 5-6	1 ppp = 10-15	1-2 x per week with 100-150 ppm	60°F Night, 70°F Day	Watch for western flower thrips.
LETTUCE	3-4 wks	1 ppp = 4-5	—	1-2 x per week with 50-75 ppm	50°F Night, 60°F Day	Watch for western flower thrips. Do not dry out.
OKRA	—	1 ppp = 3-4	—	1-2 x per week with 100-150 ppm	50°F Night, 65°F Day	—
ONION	5-6 wks	—	—	1-2 x per week with 100-150 ppm	50°F Night, 65°F Day	Do not dry out.
PAK CHOI	3-4 wks	1 ppp = 4	—	1-2 x per week with 50-75 ppm	50°F Night, 60°F Day	Keep soil dry and withhold feed to help control growth.
PEPPER	3-4 wks	1 ppp = 5	1 ppp = 8-12	1-2 x per week with 100-150 ppm	60°F Night, 70°F Day	Prevent for Bacterial Leaf Spot.
POTATO			1 ppp = 5-6	1-2 x per week with 150 ppm	55-60°F Nights	Transplant to harvest ~ 110 days.
RHUBARB		1 ppp = 6		1-2 x per week with 150 ppm	55-60°F Nights	Hardy Zones 3-9.
SIMPLY SALAD		1 ppp = 2-4	4-5 ppp = 3-6	1-2 x per week with 150-200 ppm	55-60°F Nights	Harvest to 2-3" from soil. Re-cut every 2-3 weeks.
STRAWBERRY	5-6 wks	1 ppp = 7-8	4 ppp = 10-13	1-2 x per week with 100-150 ppm	50°F Night, 65°F Day	Prevent for Powdery Mildew.
SWISS CHARD	3-4 wks	1 ppp = 4-5	—	1-2 x per week with 100-150 ppm	50°F Night, 65°F Day	Do not dry out.
TOMATO	3 wks	1 ppp = 4	—	1-2 x per week with 50-75 ppm	50°F Night, 60°F Day	—
TOMATO (PATIO)	4 wks	1 ppp = 5	1 ppp = 8-12	1-2 x per week with 50-75 ppm	50°F Night, 60°F Day	—
BASIL	3-4 wks	1 ppp = 3-4	3 ppp = 5-8	1-2 x per week with 100-150 ppm	60°F Night, 70°F Day	Watch for Downy Mildew. Pinching improves shelf life.
CATMINT	-	1 ppp = 5-6	3 ppp = 6-8	2-3 x per week with 100-150 ppm	55°F Night, 65°F Day	—
CHAMOMILE	3-4 wks	1 ppp = 3-4	3 ppp = 7-10	2-3 x per week with 100-150 ppm	55°F Night, 65°F Day	—
CHIVES	4-5 wks	1 ppp = 5-6	3-5 ppp = 7-10	2-3 x per week with 100-150 ppm	55°F Night, 65°F Day	—
CILANTRO	3-4 wks	1 ppp = 3-4	3 ppp = 5-8	2-3 x per week with 100-150 ppm	55°F Night, 65°F Day	—
CURRY	6-8 wks	1 ppp = 8-10	3-5 ppp = 10-15	2-3 x per week with 100-150 ppm	60°F Night, 70°F Day	—
DILL & FENNEL	3-4 wks	1 ppp = 4-5	3 ppp = 6-8	2-3 x per week with 100-150 ppm	55°F Night, 65°F Day	—
LAVENDER	6-8 wks	1 ppp = 8-10	3-5 ppp = 10-15	2-3 x per week with 100-150 ppm	55°F Night, 65°F Day	Watch for Bacterial Leaf Spot.
LEMON BALM (MELISSA)	3-4 wks	1 ppp = 4-5	3-5 ppp = 6-8	2-3 x per week with 100-150 ppm	55°F Night, 65°F Day	—
MARJORAM	4-5 wks	1 ppp = 5-7	3 ppp = 6-8	2-3 x per week with 100-150 ppm	55°F Night, 65°F Day	Watch for Botrytis & provide good air flow.
MINT	3-4 wks	1 ppp = 5-6	3 ppp = 6-10	2-3 x per week with 100-150 ppm	55°F Night, 65°F Day	—
MINT (variegated)	4-5 wks	1 ppp = 6-8	3-5 ppp = 8-10	2-3 x per week with 100-150 ppm	55°F Night, 65°F Day	—
OREGANO	4-5 wks	1 ppp = 6-8	3 ppp = 8-12	2-3 x per week with 100-150 ppm	55°F Night, 65°F Day	Watch for Botrytis & provide good air flow.
OREGANO (variegated)	6-8 wks	1 ppp = 8-10	3-5 ppp = 10-15	2-3 x per week with 100-150 ppm	55°F Night, 65°F Day	—

SPECIES	GROW TIME (in weeks) From 512's to packs	GROW TIME (in weeks) From 288's or 25ct to 4" pots	GROW TIME (in weeks) From 144's or 25ct to baskets or patio pots	FERTILIZER	TEMPERATURE	SPECIAL TIPS
PARSLEY	3-4 wks	1 ppp = 4-5	3 ppp = 6-8	1-2 x per week with 100-150 ppm	55°F Night, 65°F Day	Keep soil dry and withhold feed to help control growth.
ROSEMARY	5-7 wks	1 ppp = 7-9	3-5 ppp = 10-15	2-3 x per week with 100-150 ppm	60°F Night, 70°F Day	Prevent for Powdery Mildew.
SAGE	4-5 wks	1 ppp = 5-6	3 ppp = 6-10	2-3 x per week with 100-150 ppm	55°F Night, 65°F Day	—
SAGE (variegated)	6-7 wks	1 ppp = 7-8	3-5 ppp = 8-10	2-3 x per week with 100-150 ppm	55°F Night, 65°F Day	—
STEVIA	3-4 wks	1 ppp = 5-6	3 ppp = 6-8	2-3 x per week with 100-150 ppm	55°F Night, 65°F Day	—
TARRAGON	6-8 wks	1 ppp = 8-10	3-5 ppp = 10-15	2-3 x per week with 100-150 ppm	60°F Night, 70°F Day	Prevent for Powdery Mildew.
THYME	4-5 wks	1 ppp = 5-6	3 ppp = 8-10	2-3 x per week with 100-150 ppm	55°F Night, 65°F Day	Watch for Botrytis & provide good air flow.
THYME (variegated)	6-7 wks	1 ppp = 7-8	3-5 ppp = 8-12	2-3 x per week with 100-150 ppm	55°F Night, 65°F Day	—
WINTER SAVORY	4-5 wks	1 ppp = 5-6	3 ppp = 6-10	2-3 x per week with 100-150 ppm	55°F Night, 65°F Day	Watch for Botrytis & provide good air flow.

Cuttings

Note: ppp = plants per pot ☼ See specific Culture Sheet. Check "Contents" for page numbers.

SPECIES	GROW TIME (in weeks) 4" pots	GROW TIME (in weeks) 10" Hanger	TEMPERATURE (degrees F)	FERTILIZER	SPECIAL NOTES
ACALYPHA (Chenille)	1 ppp = 7-9	4 ppp = 12-14	65-75 day 60-65 night	150-200 ppmN	Pinch once. Extra iron improves foliage color.
AGERATUM	1 ppp = 7-9	—	65-75 day 60-65 night	200-250 ppmN	Multiple pinches will result in higher quality.
ANAGALLIS	—	6 ppp = 14-16	65-75 day 60-65 night	200 ppmN constant	Pinch at planting; repeat 3-4 weeks later. Needs long days and high light to flower.
ANGELONIA	1 ppp = 6-7	3-4 ppp = 9-11	65-75 day 60-65 night	150-200 ppmN	Does not grow well in low light.
ANISODONTEA	1 ppp = 6-8	—	65-75 day 60-65 night	250 ppmN	Pinch once.
ARGYRANTHEMUM (Daisy Marguerite)	1 ppp = 6-9	3 ppp = 12-14	60-70 day 55-60 night	150-250 ppmN	Soft pinch 2 weeks after planting. Feed similar to Zonal Geraniums. Can be grown cool.
BACOPA	1 ppp = 5-7	4 ppp = 12-14	60-70 day 55-60 night	100-200 ppmN	One pinch produces a bushier plant. Heavy wilt will cause flower damage and bud abortion.
BEGONIA	1 ppp = 5-7	4-5 ppp = 16	65-75 day 60-65 night	100-200 ppmN	Avoid overwatering.
BEGONIA - Solenia ☼	1 ppp = 10-12	3-4 ppp = 10-12	65-75 day 60-65 night	150-200 ppmN	Growth regulators are recommended for high quality finished product. Give soft pinch 2 weeks after planting.
BEGONIA - Rex ☼	1 ppp = 8	—	65-75 day 60-65 night	150-180 ppmN	Shady; Apply fungicide every other week for Botrytis and Leaf Spots. Never run these plants dry. NOTE: For first 2 weeks provide deep shade and warmth. High humidity is ideal. Never grow in full sun. Plant liners at same level as the potting soil.
BIDENS	1 ppp = 6	4 ppp = 10	65-75 day 60-65 night	150 ppmN constant	Pinch at planting, repeat 3-4 weeks later for hanging baskets.
BRACHYCOMBE	1 ppp = 6-8	4 ppp = 15-18	65-75 day 60-65 night	150-200 ppmN	Pinch 1-2 weeks after planting. Repeat as needed for hanging baskets.
BRACTEANTHA (Strawflower)	1 ppp = 4-6	4 ppp = 11-15	65-75 day 60-65 night	100-200 ppmN	Pinch at planting for 6" or larger pots. Avoid deep planting of liners.
CALIBRACHOA ☼	2 ppp = 6-8	4 ppp = 14-16	60-70 day 55-60 night	150-250 ppmN	Soft pinch at planting. A second pinch will produce a better plant. Do not feed heavily until plants are well rooted.

SPECIES	GROW TIME (in weeks) 4" pots	GROW TIME (in weeks) 10" Hanger	TEMPERATURE (degrees F)	FERTILIZER	SPECIAL NOTES
COLEUS	1 ppp = 4-6	4 ppp = 8-9	65-75 day 60-65 night	100-200 ppmN	Pinching will produce a bushier plant. Keep temps above 60°F or growth will stall.
COSMOS	1 ppp = 8-10	—	65-75 day 60-65 night	150-200 ppmN	Pinch at planting and again when plants are established. Needs long days and high light for abundant flowering.
CUPHEA	2 ppp = 7-9	4-5 ppp = 14	65-75 day 60-65 night	100-200 ppmN	Give 2 pinches; do not overwater. Keep soluble salts low.
CUPHEA VIENCO	2-3 ppp = 8-10	—	65-75 day 60-65 night	100-200 ppmN	Pinch once after plants are established. Full sun.
DAHLIA	1 ppp = 6-8	—	65-75 day 60-65 night	200-250 ppmN	Best for 4" pots. Interrupted night lighting during winter months reduces tuber production and improves plant body. Pinch to improve branching.
DIASCIA	1 ppp = 6-8	3-4 ppp = 9-11	60-70 day 55-60 night	150 ppmN constant	Establish root system @ 65°F, then grow cool. Pinch 2-3 times to improve branching.
DIPLADENIA	1 ppp = 6-8	3-4 ppp = 10-12	65-75 day 60-65 night	200 ppmN	Pinch at 3rd node when plants start to vine.
DOUBLE IMPATIENS	1 ppp = 6-8	4-5 ppp = 10-14	65-75 day 60-65 night	100-200 ppmN	Provide shade in summer. Keep evenly moist.
EUPHORBIA	1 ppp = 4	—	65-75 day 60-65 night	150-200 ppmN	Moderate moisture. Full sun to part shade.
EURYOPS	1 ppp = 5-7	—	65-75 day 60-65 night	300 ppmN	Full Sun. Pinch once.
EVOLVULUS	1 ppp = 8-9	3-4 ppp = 8-10	65-75 day 60-65 night	150-200 ppmN constant	Needs highest light levels possible. Keep plants moist, not wet. Pinch for fuller baskets.
FUCHSIA	—	4-5 ppp = 15	65-75 day 60-65 night	150-200 ppmN	Pinch to promote branching allowing 8 wks between last pinch and flowering date. Provide shade in spring when light levels rise. Requires long days to bloom.
FUCHSIA - MINI	1 ppp = 5-8	—	65-75 day 60-65 night	100-200 ppmN	No pinch necessary.
GAZANIA	1 ppp = 8-10	—	65-75 day 60-65 night	200 ppmN	Full Sun. Pinch 1x.
GERANIUM INTERSPECIFIC FUSION	1 ppp 6	3 ppp = 10	65-75 day 60-65 night	200-250 ppmN constant	No pinch needed.
GERANIUM INTERSPECIFIC SONATA	—	3 ppp = 8-10	65-75 day 60-65 night	200-250 ppmN constant	Soft pinch 3 weeks after transplanting.
GYPSOPHILA	1 ppp = 10-13	—	65-75 day 60-65 night	100-200 ppmN	Needs full sunlight. Moderate watering. Allow media to dry slightly between waterings.
HEBE	1 ppp = 6-8	—	65-75 day 60-65 night	100-200 ppmN	Drought tolerant once established.
HELIOTROPE	1 ppp = 5-6	—	65-75 day 60-65 night	200-250 ppmN	Pinch to promote branching.
HEMIZYGIA	1 ppp = 6-8	—	65-75 day 60-65 night	150 ppmN	Recommend 1 pinch.
IVY GERANIUM	—	5-6 ppp = 14	65-75 day 60-65 night	200-250 ppmN	To prevent edema: keep soil pH at 5.2-5.7, keep N & iron levels high, high light levels ok if not combined with high temps. Water only in early morning; keep soil moisture light when going into cloudy periods.
LANTANA	—	4-6 ppp = 14	65-75 day 60-65 night	200-250 ppmN	Do not allow to dry out between waterings; likes high heat and lots of sun; pinch to promote branching.
LINDERNIA	2 ppp = 6-8	—	65-75 day 60-65 night	200 ppmN	Half shade with good light. Pinch 1x.
LOBELIA	—	4-5 ppp = 10-12	65-75 day 60-65 night	200-250 ppmN	Pinch 2-3 times to promote branching. Very attractive.
LOBULARIA	1 ppp = 4-5	4 ppp = 8-11	65-75 day 60-65 night	150-200 ppmN	Keep moist but not overwatered. Performs well at higher temps - up to 94°F.

☛ See specific Culture Sheet. Check "Contents" for page numbers.

Note: Use lower end of fertilizer rates for pot crops; use higher end for hanger crops.

SPECIES	GROW TIME (in weeks) 4" pots	GROW TIME (in weeks) 10" Hanger	TEMPERATURE (degrees F)	FERTILIZER	SPECIAL NOTES
MANDEVILLA	1 ppp = 4-6	3-4 ppp = 10-12	65-75 day 60-65 night	200 ppmN	Pinch recommended.
NEMESIA	1 ppp = 4-6	3-4 ppp = 9-11	60-70 day 55-60 night	100-200 ppmN	Keep moist, but not wet. Do not allow it to wilt. Use fresh water regularly so salts do not build up.
NEW GUINEA IMPATIENS ☼	1 ppp = 9-12	3-4 ppp = 14-16 add 2 wks for Harmony Series	65-75 day 60-65 night	100 ppmN	Do not overwater in the beginning; allow pots to dry down before watering again. Clear water until roots reach sides & bottom of pot. Do not like cool night temps, under 63°F will result in poor growth, small leaves, poor branching, more Botrytis, and root problems; provide shade in spring.
OSTEOSPERMUM ☼	1 ppp = 5 (from pre-cooled liner)		60-70 day 55-60 night	150-200 ppmN	Best grown cool. 6 weeks at 46-47°F produces most flowers.
PACHYSTACHYS	1 ppp = 6	3 ppp = 12-14	65-72 day 65-72 night	150-200 ppmN	Watch for spider mites, whiteflies and aphids.
PENSTEMON	1 ppp = 6-8	—	60-70 day 55-60 night	150-200 ppmN	Grow in full sun.
PETUNIA- CASCADIA ☼	1 ppp = 5-8	3 ppp = 8-12	60-70 day 55-60 night	150-200 ppmN	Likes high light (5000-9000 FC). Give 1 - 2 pinches.
PURSLANE	1 ppp = 5-7	4-5 ppp = 11-17	65-75 day 60-65 night	100-200 ppmN	Likes high light (5000-7500 FC), high heat and is able to thrive in drought-like conditions; good to leach pots every 4 waterings. Likes lower feed.
REGAL GERANIUM from pre-budded line ☼	1 ppp = 8-10	—	60-70 day 55-60 night	200-250 ppmN	Give good dry down to control size. Do not, however, let soil dry out after buds have developed well. Full sun until showing color then provide some shade. Sensitive to high salt levels.
RUELLIA	1 ppp = 6	—	65-75 day 60-65 night	150-200 ppmN	Full sun to part shade. Pinch 1x.
SALVIA - GREGGII	1 ppp = 7-11	—	65-75 day 50-60 night	200-250 ppmN	Pinch once established, approx 10 days after planting. A second pinch is advised for better branching in larger pots, leaving 4 leaves beneath the cut. Salvia greggii is very drought tolerant.
SALVIA - SALLYFUN	1 ppp = 6-8	—	65-75 day 60-65 night	100-200 ppmN	Full sun. Pinch once if you want more plant body.
SANVITALIA	—	3-4 ppp = 12-14	65-75 day 60-65 night	200 ppmN	Cooler temps retard growth. Pinch multiple times. Sensitive to overwatering; keep on the dry side.
SCAEVOLA	1 ppp = 8-10	3-5 ppp = 12-14	65-75 day 60-65 night	150-200 ppmN	Likes high light (5000-9000 FC). Give 2-3 pinches. Feed little to no phosphorous.
SCUTELLARIA	1 ppp = 8-10	—	65-75 day 60-65 night	200 ppmN	Full sun to half shade. Pinch 2x.
SNAPDRAGON	1 ppp = 6-10	4-5 ppp = 9-12	65-75 day 60-65 night	200 ppmN	Pinch for bushier growth. Allow soil to dry between waterings.
SUNPATIENS ☼	not recommended	1 ppp = 10-12	65-75 day 60-65 night	200 ppmN low ammonium	1 plant per quart or 6" pot. Grow in full sun with plenty of space to help control stretch. Growth retarding with B-nine while plants are smaller can help to promote good branching. Avoid using Bonzi. See specific culture sheet.
THUNBERGIA	1 ppp = 6-8	3 ppp = 10-12	70-80 day 60-65 night	175-225 ppmN	Needs warm nights. Do not allow to wilt. Use high nitrate feed (not ammonium).
TIBOUCHINA	1 ppp = 8-10	—	65-75 day 60-65 night	200 ppmN	Full sun. Pinch 1x.
TORENIA	1 ppp = 5-8	5 ppp = 12-14	65-75 day 60-65 night	100-200 ppmN	Very easy to grow, does well in a wide range of growing conditions. One pinch produces a bushier plant.
VERBENA	1 ppp = 6-8	4-5 ppp = 11-17	65-75 day 60-65 night	200-250 ppmN	Pinch for bushier growth. Do not allow plants to dry out; use a light shade in late spring when light levels rise. Powdery mildew prevention needed; monitor iron levels.
VIOLA - Velocity	1 ppp = 6	—	60-70 day 55-60 night	250 ppmN	Pinch 2 weeks after planting.
ZONAL GERANIUM	1 ppp = 5-7	4 ppp = 10-14	65-75 day 60-65 night	100-200 ppmN	Cuttings yellow quickly in a dark shipping box. Grow under medium shade for one week. Feed well; give full light after first week. Yellowing will not harm the plant if handled properly; allow to dry down between waterings.
ZONAL GERANIUM PILLAR	1 ppp in gallon trellis pot = 10		65-75 day 60-65 night	250 ppmN	Pinch when plants are 6-7" high removing growing tip plus 2 leaves. Provide a cage or trellis. Tie once per foot of growth.

Foliage

Note: ppp = plants per pot

SPECIES	GROW TIME (in weeks) 4" pots	GROW TIME (in weeks) 10" Hanger	TEMPERATURE (degrees F)	FERTILIZER	SPECIAL NOTES
ABUTILON	1 ppp = 6	—	65-75 day 60-65 night	150-200 ppmN constant	Pinch at planting. Repeat 4-5 weeks later.
ALTERNANTHERA	1 ppp = 6	—	65-75 day 60-65 night	200-250 ppmN	Easy to grow.
CHLOROPHYTUM	1 ppp = 8	6-8 ppp = 18-24	65-75 day 60-65 night	50-100 ppmN	Plants should dry down between waterings but do not let soil dry out. Partial shade.
COLOCASIA ☼	1 ppp = 6 wks in gallon pot		70-80 day 50 night	150-200 ppmN	Full sun; moist soil. Sensitive to high salt levels.
CORDYLINE	1 ppp = 14-18	—	70-85 day 65-68 night	150-200 ppmN	Tolerates wide range of conditions. Likes high light and warm temperatures.
CRASSULA	1 ppp = 6-8	—	65-75 day 60-65 night	100-200 ppmN	Tolerates wide range of conditions. Likes high light and warm temperatures.
DRACAENA - marginata	2-3 ppp = 8-10	—	75 day & night	200-250 ppmN	Tolerates wide range of conditions. Likes high light and warm temperatures. Water requirements are low.
DURANTA	1 ppp = 6	—	65-75 day 60-65 night	150-200 ppmN	2-3 pinches for shaping.
ECHEVERIA	1 ppp = 4-6	—	50-65 night	200-250 ppmN	—
GERMAN IVY	1 ppp = 4-5	4-5 ppp = 13-17	65-75 day 60-65 night	150-250 ppmN	Easy to grow. Provide shade in spring when light levels rise. Treat like foliage. Do not overwater.
GLECHOMA	2 ppp = 6-7	—	60-70 day 55-60 night	200 ppmN	Full sun to part shade. Pinch once.
HEDERA	1 ppp = 5-6	5-7 ppp = 20-25	65-75 day 60-65 night	150-200 ppmN	Well drained soil with pH between 5.5 and 6.5.
HELICHRYSUM	1 ppp = 7-9	3-5 ppp = 10-14	65-75 day 60-65 night	100-200 ppmN	Pinch at planting to produce a well-shaped plant; trim as needed. Dry down to damp between waterings. Rinse after feeding. Best to step up 4" before planting into large pot.
IPOMEA	1 ppp = 4-6	3-4 ppp = 8-10	65-75 day 60-65 night	150 ppmN	Pinch as necessary. Excellent as an accent.
IRESENE	1 ppp = 8-10	—	65-75 day 60-65 night	150-200 ppmN	Pinch for bushier growth. Reduce water & feed to control height.
KALANCHOE	1 ppp = 4-6	—	50-65 night	200-250 ppmN	—
LAMIUM	1 ppp = 6-8	3-4 ppp = 10-12	65-75 day 60-65 night	150-250 ppmN	Pinch at planting, trim as needed. Full sun. Cool bright conditions improve plant habit.
LYSIMACHIA	1 ppp = 7-9	3-4 ppp = 8-10	65-75 day 60-65 night	200 ppmN	1-2 pinches recommended. Allow soil to dry between waterings.
MUSA	1 ppp = 6-10 wks in a 6"-10" pot.		65-75 day 60-65 night	200-250 ppmN	Keep soil moist. Full sun to partial shade. Plants love a rich soil.
OXALIS	1 ppp = 6-8	—	65-75 day 60-65 night	200-250 ppmN	Pinching and PGR's not necessary.
PERILLA	1 ppp = 5-7	3-4 ppp = 8-11	65-75 day 60-65 night	150-200 ppmN	Loves heat and full sun. Keep well watered.

☼ See specific Culture Sheet. Check "Contents" for page numbers.

Note: Use lower end of fertilizer rates for pot crops; use higher end for hanger crops.























SPECIES	GROW TIME (in weeks) 4" pots	GROW TIME (in weeks) 10" Hanger	TEMPERATURE (degrees F)	FERTILIZER	SPECIAL NOTES
PILEA	2 ppp = 4-6	6-8 ppp = 14-18	65-75 day 60-65 night	80-150 ppmN	Watch for aphids. Pinch twice.
PLECTRANTHUS	1 ppp = 4-5	—	65-75 day 60-65 night	100-200 ppmN	Pinch to promote branching.
PSEUDERANTHEMUM	1 ppp = 6	—	65-75 day 60-65 night	150-200 ppmN	Full sun to part shade. Pinch once.
SEMPERVIVUM	1 ppp = 4-6	—	50-65 night	200-250 ppmN	—
SENECIO	1 ppp = 5-7	—	75-80 day 60-65 night	100-150 ppmN	—
SETCREASEA	1 ppp = 6	4 ppp = 10-12	65-75 day 60-65 night	200 ppmN	Pinch once if needed. Will tolerate almost any temperature. Full sun to part shade.
STROBILANTHES	1 ppp = 6-8	4-5 ppp = 12	65-75 day 60-65 night	200 ppmN	Needs bright light, high humidity, and warm temperatures.
VINCA VINE & MACULATA	2 ppp = 6-8	—	65-75 day 60-65 night	100-200 ppmN	Very easy to grow, do not allow to dry out excessively; pinch often to promote branching.
WANDERING JEW	1 ppp = 4-6	4 ppp = 15-18	65-75 day 60-65 night	100-150 ppmN	Keep soil moist at all times.
TROPICAL FERNS	1 ppp = 8-10	3 ppp = 20-30	72 day & night	100-200 ppmN	Do not plant deep. Ferns stop growing at soil temps below 62°F.
HARDY FERNS	1 ppp = 8-14	—	Above 60 day & night	100-200 ppmN	Will tolerate wide range of temperatures. Keep moist - not wet.

Note: Use lower end of fertilizer rates for pot crops; use higher end for hanger crops.



Ornamental Grasses

Use 288 plugs or 1 rooted cutting for 4" pots up to 1 gallon.

SPECIES	Crop Time (weeks) At Cool Temps 47°-54°F	Crop Time (weeks) At Warmer Temps 57°-65°F	FERTILIZER	HARDINESS ZONE	SUN & SHADE	SPECIAL NOTES
ANEMANTHELE BUFFALO GOLD, SIROCCO	24-28	12-14	100-200 ppmN	6-8		—
CAREX AMAZON MIST	24-28	10-14	100-200 ppmN	6		—
CAREX BRONCO	24-28	10-14	100-200 ppmN	6		—
CAREX BRONZITA	24-28	10-14	100-200 ppmN	5		—
CAREX EVERGOLD	20-24	9-11	100-200 ppmN	6-9		Prefers part shade. Do not allow to dry out.
CAREX PRAIRIE FIRE	24-28	10-14	100-200 ppmN	5		—
CAREX RED ROOSTER	24-28	10-14	100-200 ppmN	5		—
CAREX REKOHU SUNRISE	—	8-10	100-200 ppmN	7-11		—
CORTADERIA SELLOANA WHITE	not recommended	6-8	100-200 ppmN	8-11		Moisture: dry to medium.
CORYNEPHORUS SPIKY BLUE	—	6-8	100-200 ppmN	6-10		—
ERAGROSTIS WIND DANCER	10-12	5-6	100-200 ppmN	6		Don't allow plants to wilt.
ERIANTHUS RAVENNAE	not recommended	6-8	100-200 ppmN	6-9		Moisture: dry to moist.
FESTUCA FESTINA	24-28	8-10	100-200 ppmN	4		—
HAKONECHLOA AUREOLA	24-28	8-10	100-200 ppmN	5-9		Full sun to part shade. Do not allow to dry out.
ISOLEPIS LIVE WIRE	10-12	5-6	100-200 ppmN	Annual		Don't allow plant to wilt.
JUNCUS BLUE ARROWS	12-14	6-7	100-200 ppmN	5-11		Can be grown wet.
JUNCUS BLUE DART, TWISTED DART, TWISTER	—	6-8	100-200 ppmN	5-11		Can be grown wet.
JUNCUS JAVELIN	10-12	5-6	100-200 ppmN	7		Can be grown wet.
JUNCUS TWISTED ARROWS	12-16	6-8	100-200 ppmN	5		Can be grown wet.
KOERLERIA COOLIO	24-28	8-10	100-200 ppmN	4		—
PENNISETUM RED RIDING HOOD, RUBRUM, SETACEUM	not recommended	4-6	100-200 ppmN	9-11		Color is brightest under high light.
STIPA PONY TAILS	12-16	6-8	100-200 ppmN	5-8		Moisture: medium to moist

Perennials

For using our plugs & rooted cuttings...

1. These are ideal for green spring perennials or first year bloomers. Use a well drained potting media, and grow on at 60°F night, 70°F day. Feed with 150-250 ppmN.

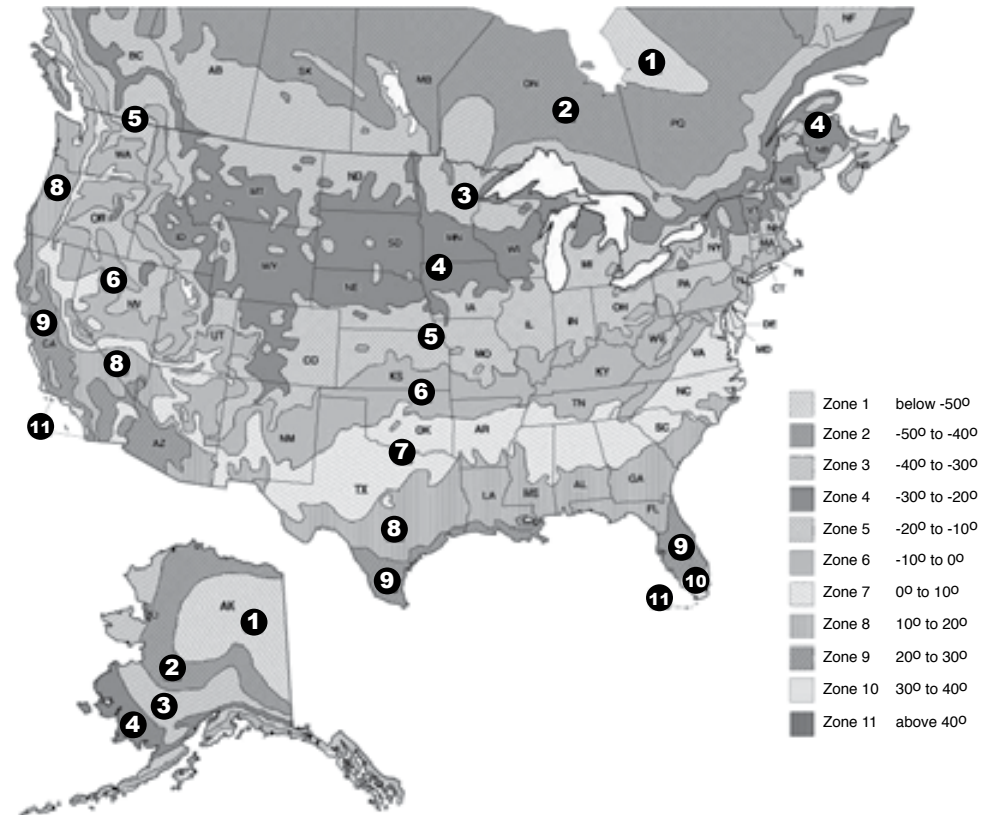
Crop time from a 144 plug:

- Approximately 4-6 weeks for 4" pots; 1 plant per pot.
- 8-10 weeks for 1 gallon pots using 1-3 plants depending on the variety.
- Add approximately 2 weeks if using 288's.

Remember, flowering is triggered by cold treatment, natural bloom date, and length of days, not crop weeks. A number of first year blooming perennials will flower only during long days.

2. Overwinter your own perennials. Purchase them during the summer. After planting, allow several weeks for plants to become well rooted with mature crowns. Then temperatures can be lowered to 35-40°F for two weeks, then lowered again to 28-30°F (tender perennials such as grasses and delphinium must be kept warmer). Keep cool for 8-12 weeks. Ship in spring and summer when plants are ready. Overwintering success depends on having well-rooted, established plants BEFORE the cold sets in. If you are not using a greenhouse where temperatures can be controlled, you will need to use thermal blankets, straw or other means of keeping the plants from freezing.

☼ See specific Culture Sheet for Hibiscus Luna.
Check "Contents" for page numbers.



SPECIFIC CULTURE SHEETS

Begonia Rex

Information courtesy of Ron Adams

TRANSPLANTING:

Do not plant liners too deep. The soil level of the liner should match the soil level of the container.

MEDIA:

Use a well-drained, disease-free medium with a pH of 5.8 to 6.2 and medium initial nutrient charge. Peatlite mixes work well. High EC will stunt growth and cause marginal leaf burning. Do not exceed an EC of 1.8 SME (Saturated Media Extract).

LIGHT:

Rex Begonias are a shade crop. For the first 2 weeks after planting, light levels should be about 900 fc or 70% shade (9,000 lux). From week 3 to finish, light levels should be maintained between 1,500 and 2,500 foot candles or 50% shade (15,000 to 25,000 lux). Rex Begonias are a short day crop (they flower under short days (less than 12 hours) and do not require supplemental lighting.

TEMPERATURE:

Night: 65 to 70°F (18 to 21°C) with a minimum of 60°F

Day: 70 to 80°F (21 to 27°C) with a maximum of 90°F

- Do not run cool (under 65°F) for the first 14 days after transplanting.

WATERING & FERTILIZER:

Rex Begonias prefer a constant, moderate soil moisture. Wet conditions will encourage root diseases. Moderately moist is ideal, and they should never dry out. Overhead watering is not recommended on Rex Begonias. Constant feed with 100 ppm Nitrogen with a balanced fertilizer. 20-10-20 or 15-5-15 is recommended.

GROWTH REGULATORS - Always follow the label.

Growth regulators are generally not necessary, but when light levels are lower than optimum, some stretch can occur. One application of A-Rest 50 ppm will control the stretch.

PINCHING:

Pinching is not needed.

SPACING:

Do not crowd Rex Begonias. Plants should be given plenty of space in all stages of development. Over-crowding results in petiole stretch and often bacterial leaf spots. Plants should be re-spaced when they begin to touch each other.

COMMON PESTS:

Aphids, Mealybugs, Thrips

Diseases/Recommended Fungicides - Always follow the label.

The best control is good ventilation and plenty of space between plants. Foliar spraying is not recommended on Rex Begonias, and should not be a common practice. Apply a rotation of the fungicides below every 2 weeks.

Powdery Mildew - Foliar Spray with Compass-O, Cygnus, Heritage or Phytan 27

Botrytis Blight - Foliar Spray with Dithane, Daconil, Decree, or Endorse

Myrothecium - Foliar Spray with Compass-O, Heritage or Medallion

Bacterial leaf spot - Foliar Spray with Kocide (not recommended close to shipping time because of spray residue.)

GENERAL CROP SCHEDULING GUIDELINES:

From a 25 count liner		
4-inch - 5-inch Pot:	1 liner per pot	6 to 8 week crop time
6-inch Pot:	1 liner per pot	10 to 12 week crop time
8-inch Pot:	2 - 3 liners per pot	10 to 12 week crop time
10-inch Basket :	3 - 4 liners per pot	12 to 14 week crop time

Begonia Solenia

Information courtesy of Ecke Ranch

INTRODUCTION: The Solenia® begonia series offers easy to produce options that are a comfortable fit with most all warm climates, high light spring production practices. Additionally, the Solenia® begonias provide some of the highest garden performance in today's market.

POT SIZES: Solenia® begonias are perfectly suited for production in commercial forms of 5" or larger. They are an excellent hanging basket, and can be used in larger basket forms (12" or greater) and in combination planters. Production in commercial forms smaller than 5" are very challenging given the vigor of this product.

LIGHT: Unlike other competitive products Solenia® begonias thrive in high light environments. Solenia® begonias will thrive in light intensities up to 5,000 foot-candles in a greenhouse. Solenia® begonias are a day neutral crop, so they will flower on a year round basis. Additional lighting in the initial phases of crop development is very beneficial. Growers can consider using either assimilation lighting for either the entire crop or only for the first four weeks combined with cyclic lighting of 10 minutes per half hour for the balance of the crop. Assimilation lighting should be implemented at the rate of 3.5 watts/sq. ft., with a total day length of 16 to 18 hours. The use of assimilation lighting is especially useful in developing strong vegetative growth during the winter months.

TEMPERATURE: Until the transplants are well rooted, "heat to" temperatures should be maintained at 68° F (day and night). Once plants are well rooted, temperatures can be reduced to 64° F (day and night) for the balance of the growth cycle. For additional plant tone during the last two weeks of the crop cycle, temperatures can be reduced to 58° F. Ventilation should occur when temperatures exceed 75° F.

TRANSPLANTING/PINCHING: Solenia® begonias should be transplanted into a well drained, low to moderate EC substrate. Cuttings should be transplanted upon receipt or when they have reached maturity in the propagation phase. Cuttings that are held for even short periods of time before transplanting will not branch as freely as product that is handled at the proper maturity. Plants should be "soft" pinched no later than two weeks after transplanting. The process should leave three (3) to four (4) leaves below the pinch. The pinch removes any pre-mature buds that may have developed in the apical meristem and the subsequent lateral shoots that are developed under long days or supplemental lighted regimes. This will provide the vegetative structure for a successfully proportioned plant.

FERTILITY: After transplanting and successful rooting out of the original plug, initial feeding practices of 125 ppm N of Calcium Nitrate should be conducted for one to two weeks. From this point forward until week six of the crop, plants should be fed with 150 ppm N 15-5-15. After week six plants can be fertilized with potassium nitrate or a balanced fertilizer high in potassium. It is important to avoid using fertilizer compounds high in ammonical nitrogen; these fertilizers will provide excessive vegetative growth and softer plants, which may be more problematic in transport.

SUPPLEMENTAL CO2: Solenia® begonias will benefit from supplemental injection of CO2 at the rate of 750 ppm, during the daylight hours of the day. CO2 injection should start ½ hour prior to sun rise and continue until the first stage of ventilation is required, and at that time the process should be discontinued. Higher rates will promote excess vegetative growth, requiring additional applications of PGRs.

PGRS: Solenia® begonias are very vigorous growers, and are best suited for use in larger forms. Growth regulation is necessary to recognize the highest quality plants. Cycocel® may be applied at the rate of 750 ppm on bi-weekly intervals, or Bonzi® may be applied at the rate of 3 to 5 ppm as a foliar application near the finish of the crop. A negative DIF may also be employed, and the DIF should be managed in the range of 5° to 7° F throughout the crop.

CROP SCHEDULING:

The following table is offered as a starting point for scheduling certain popular forms of this product. Realize that the stated times are not absolute and subject to the amount of light, temperature and fertility that the crop may receive.

Container	Plants per Container	Transplant to Pinch	Total Crop Time
5"	1	2 weeks	7 weeks
1 gallon	1	2 weeks	9 weeks
10" hanging basket	3	2 weeks	10 weeks
12" hanging basket	4	2 weeks	12 weeks

Calibrachoa

Information courtesy of Ron Adams

MEDIA:

Always water plants thoroughly before planting. Use a standard, well-drained, disease-free potting mix with medium fertilization. Starting pH should be 5.2 - 5.8. Maintain a low pH throughout the crop cycle by either using an acid fertilizer or reducing water alkalinity with acidification. Have the water tested at a laboratory to determine alkalinity levels.

LIGHT:

Full sun to part shade (particularly in the summer when the temperatures are hot). Low light levels can cause soft, stretchy growth and an unattractive plant habit. High light levels will help produce an excellent product. During short days (less than 12 hours of natural day length), use supplemental lighting of 14½ hours or more to initiate flowering.

TEMPERATURE:

Night: 60 to 65°F (15 to 18°C)

Day: 68 to 72°F (20 to 22°C)

ADT (Average Daily Temperature): 65 to 68°F (18 to 20°C)

Cool temperatures (60°F night and 68°F day) will help produce a quality product, but will require a longer crop time.

WATERING:

Do not allow plants to dry out in any stage. Keep plants moist, but not wet, for the first week or so until rooting is established. Once rooting is established allow moderate dry-down between waterings. On larger containers, where larger growth is desired, keep moist for a longer period, then begin dry-down cycles. Regular, moderate stress helps to promote good roots, strong top growth and quick bloom times. Leach pots periodically to prevent salt build up.

FERTILIZER:

Calibrachoa is a heavy feeder. Constant feed with 200 - 300 ppm with average levels of micronutrients, and with slightly higher iron levels to maintain green foliage. Use an acid fertilizer such as 21-5-20, 20-10-20, or 23-3-19 plus Magnesium.

GROWTH REGULATORS - Always follow the label.

High light levels in combination with cool temperatures will help reduce the need for growth regulators. Using a negative DIF (night temperature is warmer than the day temperature) will also help control stretch. A drench with 1 - 5 ppm Bonzi/Piccolo/Paczol (0.03 to 0.16 fl oz/gal), (concentration will vary with the season) is also very effective. Below are general guidelines.

8" basket: 1-1½ cups per pot (of the above solution)

10" basket: 1½-2 cups per pot

12" basket: 2-2½ cups per pot

B-Nine/Dazide - 2,500 to 5,000 ppm (0.39 to 0.79 oz/gal), 1 to 2 applications after the first pinch.

PINCHING:

We recommend pinching at least once in 4-inch to 6½-inch pots, unless you are buying a pre-pinched product. A hanging basket may require 1 to 2 pinches. Allow 7 to 9 weeks from pinch to bloom, longer below 65°F ADT (Average Daily Temperature).

SPACING:

4 inch pots - 1 to 3 inches between pots

6 inch pots - 3 to 5 inches between pots

8 inch pots - 4 to 8 inches between pots

COMMON PESTS:

Aphids, Thrips

Diseases/Recommended Fungicides - Always follow the label

Powdery Mildew - Foliar spray with Compass-O, Heritage, Milstop or Systhane

Thielaviopsis or Phytophthora - Soil drench with Cleary's/Subdue 1 week after planting.

(This is particularly useful on hangers, where treatment can be difficult after hanging.)

GENERAL CROP SCHEDULING GUIDELINES...From a 50 count cutting:

306 Pack:	1 cutting per cell	5 to 9 week crop time
4 inch (10cm) pot:	1 to 2 cuttings per pot	5 to 9 week crop time
6½ inch (16cm) pot:	2 to 3 cuttings per pot	6 to 10 week crop time
Basket :	4 to 5 cuttings per pot	10 to 16 week crop time

Cineraria

Venezia

Information courtesy of Goldsmith Seeds

Venezia is the first F1 hybrid cineraria on the market. Venezia requires very little cold treatment to induce flowering. This makes programmability a snap, and truly extends the growing and flowering season through autumn, winter and spring. Venezia is 10 days earlier to flower than Jester. The medium-size leaves and compact habit make Venezia perfect for 5" pots; however, it's versatile enough to be grown in 4.5" pots, and as compact 6" pots. Venezia is the only series on the market to have a pure white color in addition to the striking ring types. Flower heads are produced immediately above foliage, and show no stem stretch for holdability. It's the ideal package of earliness, a great habit, and broad color range.

MEDIA:

Use a well-drained media

pH: 5.9 - 6.2

EC: 0.75 - 1.0

TEMPERATURE:

After potting until roots reach edge of container 65°F (18°C)/day and 60°F (16°C)/night. Temperatures can be dropped to 60°F (16°C)/day and 58°F (14°C)/night until bud initiation. Once buds appear, temperatures can be further dropped to 58°F (14°C)/day and 54°F (12°C)/night temperatures. Flowering plants can be held at 54°F (12°C)/day and 50°F (10°C)/night.

MOISTURE:

Allow media to dry slightly between watering. Do not allow plants to wilt.

FERTILIZATION:

100 - 150 ppm weekly with a calcium-based fertilizer (13-2-13)

TRANSPLANTING:

Into final container when 3 - 4 true leaves are present

SPACING:

Grow pot tight until foliage reaches the pot rim.

GROWTH REGULATORS:

Chemical growth regulators are not necessary. For toning purposes, growth can easily be controlled with either B-Nine, DIF, reduced watering, or reduction of ammonium.

COMMON DISEASES: Pythium, Botrytis, Powdery Mildew, Verticillium, Tomato Spotted Wilt Virus

COMMON INSECTS: Aphids, whiteflies, thrips

CROP TIME:

Approximately 14 - 16 weeks. 5 - 6" (13 - 14 cm) containers should require no growth regulators.

4" (10 cm) production is possible with some growth regulation.

Colocasia

Royal Hawaiian® Collection

Information courtesy of Plant Haven

HARDINESS: USDA Zones 7b-11: frost will trigger dormancy.

LIGHT: full sun for best color.

SOIL: Rich, moist. Colocasias are wetland plants. Burnt leaf edges can be a sign of under-watering.

TEMPERATURE: the warmer the better for fast growth.

FERTILIZER: avoid over-feeding.

TRAY SIZE: 25

RECOMMENDED FINISHED POT SIZE: 1 gallon and larger.

FINISH TIME (when grown warm):

From liner to 1 gallon pot: approx. 6 weeks.

From liner to 5 gallon pot: approx 12-15 weeks.

From liner to 15 gallon pot: approx. 20-24 weeks (select colors).

Treat as other tropicals. Avoid extended dry periods.

Gerbera

Information courtesy of Ball Horticultural

MEDIA: use a light and well-aerated media.

POT SIZE: 12 cm pots (pH 5.5-6).

IRRIGATION: overhead watering is possible until the flowerbuds appear, but watering directly into pot or grow with ebb/flow floors is preferred.

DENSITY: after potting the density is approx. 80 pl/m² for 3-4 weeks; by then the plants need to be spaced to 20-25 pl/m² until end of culture.

TEMPERATURE: best results with 19/19°C or 19/17°C. In darker periods day/night temperatures can be reversed to keep stem length somewhat shorter.

DISEASES/PESTS: should any disease or pest (mildew, white fly, thrips) emerge, treat with an appropriate pesticide.

FERTILIZATION: Gerbera requires relatively high fertilization.

LIGHT: Gerbera likes to be grown under high light conditions. During the darker period of the year, additional lighting can be applied.

CROP TIME: depending on the sowing date, the available light and the required pot/plant ratio, the culture will take approx. 14 weeks from sowing to 50% flowering. The second 50% can be reaped in 10-14 days.

This information is based on West European conditions and is given for general guidance only. No guarantee is given for the result of the crop, nor is liability accepted for the consequences of applying above indications.

Hibiscus

Luna Series

Information courtesy of PanAmerican Seed

Growing On To Finishing:

CONTAINER SIZE: Luna Hibiscus is best suited to quart, gallon or larger containers (15 cm or larger). For quart and gallon containers (15-19 cm), use one plant per pot. For large containers (> 19 cm) use 1 to 3 plants per pot.

MEDIA: Use a disease-free, peat-based, soilless medium with a pH of 6.0 to 6.5 and a medium initial nutrient charge (EC 0.75 mmhos/cm with a 1:2 extraction). "Nursery mixes" that contain soil can also be used, but may require an additional week of crop time and will have darker green foliage.

TEMPERATURE:

Days: 70 to 85° F (21 to 30°C).

Night: 65 to 70° F (18 to 21° C).

Warmer growing conditions result in shorter crop times. Do not allow average daily temperatures to drop below 68° F (20° C). Plants can become chlorotic and sensitive to pesticide spray (phytotoxicity) when grown at cooler temperatures.

LIGHT: Keep light levels as high as possible. Plants grow best under full sun. Space plants to allow light to reach basal area. This promotes better branching.

PHOTOPERIOD: Luna Hibiscus requires a minimum of 12 hours of daylength to flower. Flowering is faster when daylength is 14 hours or longer. Supplemental lighting should be used under shorter days.

WATERING: Keep media moist to wet. Consistent soil moisture is important and plants should not be allowed to wilt. Growing plants too dry will result in flower bud abortion.

FERTILIZER: Feed plants weekly at 200 to 250 ppmN in a complete fertilizer.

PINCHING: Is not recommended. Luna Hibiscus branches naturally without pinching. Best branching occurs when plants are spaced when the foliage touches the sides of the pot.

PLANT GROWTH REGULATORS: A tank mix of Cycocel at 750 to 1,000 ppm and B-Nine at 2,500 ppm has been tested in different climates in the U.S. and shown effective. Apply PGR's 2 weeks after transplant. Repeat application 2 weeks later if necessary.

Optional treatment: Bonzi drench at a very low rate of .25-0.5 ppm with multiple applications (2 to 3 times) is also effective. Be careful when using Bonzi drench as it is very easy to stunt plants, especially for northern growers.

If you are growing in a nursery mix that includes soil, less PGR may be needed. One application 3 to 4 weeks after transplanting may be sufficient.

COMMON PROBLEMS:

Insect: Thrips, aphids, spider mites.

Disease: No serious problem.

CROP SCHEDULING:

Transplant to flower: 10 to 13 weeks.

The shorter crop times occur under warmer growing temperatures and longer daylength. If using a nursery mix, add one week to total crop time.

IN THE GARDEN: Plant Luna Hibiscus in full sun locations (at least 6 hours of direct sunlight). Luna hibiscus can be planted in soil near ponds or water gardens. It will also tolerate dry conditions once it is established. When planted in a row, Luna Hibiscus makes a hedge 2 to 3 ft. (60 to 90 cm) tall and about 2 ft. (60 cm) wide. Luna Hibiscus can also be used in larger patio containers. Water and fertilize regularly with an all-purpose fertilizer for best results. If the foliage turns light green, it is an indication that it needs to be fertilized.

Luna Hibiscus are perennial to USDA Hardiness Zone 5. Plants die back all the way to the ground in the winter, then usually do not start growing until late May when the soil warms up. Overwintered plants will flower from mid-July on, with flowering decreasing in cooler fall weather.

New Guinea Impatiens

Information courtesy of Danziger

PLANTING:

For 4" pot, use 1 plant per pot. Ready for sales within 8-10 weeks.
For 6" pot, use 1-2 plants per pot. Ready in 10-12 weeks. For 10" hanging baskets or pots use 3 - 4 plants.
Ready in 12-14 weeks.

PINCHING:

Not necessary.

LIGHT INTENSITY:

Partial shade. N.G.I responds to assimilation lighting by enhancing development and flowering. When natural light intensity is less than 4000-5000 fc/40,000-50,000 lux, it is essential to add artificial light of 3000-4000 fc/30,000-40,000 lux, for 14-18 hours a day. Lighting should be given 2-3 weeks after planting. Shading may be required if irradiance levels exceed 5000 fc/50000 lux (late spring).

TEMPERATURE:

Day 64-70°F (18-21°C), Night 60-70°F (16-21°C). Stem elongation is caused due to high temperatures and the opposite is achieved in low temperatures.

FERTILIZATION:

Low levels for the first four weeks. Moderate levels for remaining crop cycle when roots reach the sides of the pot, fertilize up to a level of 150-200 ppm N, 80 ppm P, 150 ppm K. Ensure proper runoff to prevent salt accumulation because of sensitivity to high salt levels.

IRRIGATION:

Keep well watered. Avoid over-watering. Drip irrigation is recommended.

MEDIUM:

Use a well-drained disease-free mix. pH: 5.8 - 6.2, EC: 0.5-0.7

GROWTH REGULATORS:

Not required.

DISEASES & PEST CONTROL:

Insects: Spider Mites, Thrips, and Diseases: Botrytis and Myrothecium. Maintain moderate humidity levels and good air circulation as a preventative. Drench with a broad-spectrum fungicide at liner planting.



Ornamental Grasses

Information courtesy of Ron Adams

TRANSPLANTING:

Do not bury the plugs too deeply when transplanting.

MEDIA:

Use a well-drained, disease-free, soilless medium with a pH of 5.5 to 6.2 and a medium initial nutrient charge.

LIGHT:

Do not shade Grasses. High light will improve crop quality (5,000 fc or greater). Maintain light levels as high as possible, if temperature can be controlled.

TEMPERATURE:

Night: 59 to 64°F (15 to 18°C)

Day: 62 to 74°F (17 to 23°C)

These Grasses can be grown under temperatures as low as 50°F (10°C), but crop time will increase significantly.

WATERING:

Do not allow plants to wilt. The Juncus Grasses can be grown in very wet conditions.

FERTILIZER:

Constant feed with 100 ppm Nitrogen with a calcium-based fertilizer (13-2-13, 15-0-15 or 14-4-14), or feed weekly with 175 - 225 ppm Nitrogen with a calcium-based fertilizer. Avoid using excessive ammonia nitrogen-form fertilizers and overfeeding, as these will result in less upright plants.

GROWTH REGULATORS - Always follow the label.

PGRs are not needed. However, for Juncus Javelin, a Bonzi (paclobutrazol) spray at 30 ppm (.96 fl oz/gal) 2 weeks after transplant is beneficial to reduce leaf bending by making the plants stronger and more compact.

PINCHING:

Pinching is not needed.

SPACING:

Can be grown pot tight.

DISEASES/RECOMMENDED FUNGICIDES:

No known problems.

COMMON PESTS:

Aphids, Whitefly, Thrips

GENERAL CROP SCHEDULING GUIDELINES:

From a 288 plug	
306 pack: 6 to 8 weeks to finish	1 plug per cell
4 inch (10cm) pot: 7 to 9 weeks	1 plug per pot
6 inch pot: 6 to 8 weeks	3 plugs per pot
From a 144 plug	
4 inch (10cm) pot: 6 to 8 weeks	1 plug per pot
6 inch pot: 5 to 7 weeks	3 plugs per pot

Ornithogalum dubium

Information courtesy of Asa Bulbs.

APPLICATION: Blooming pots traditionally sold for Easter and Mother's Day.

MAIN ATTRIBUTES:

Attractive raceme with up to 30 florets.
All florets open gradually, giving unusually extended flowering time.
Minimum labor in production.
Easy to handle and ship.

PLANTS PER POT: Plant 1 plug in a 4" pot, and 3 plants in a 5" pot.

MEDIA: Use a well drained, disease-free, soilless medium with a pH of 5.2-5.8 and a medium initial nutrient charge.

IRRIGATION/FERTILIZATION: 70-130 ppm Nitrogen. Keep the planting medium moist, but avoid overwatering. Drip irrigation is recommended to discourage disease outbreaks.

LIGHT: Full Sun, during low light time of year. HID lights will increase quality and give faster bloom time.

TEMPERATURE:

Night : 55° F
Day : 60° F
ADT 55-60° F
Crop can be grown warmer with high light levels. This will bring on flowers sooner. However, in lower light conditions, crop **MUST** be grown at cool temperatures for good blossom quality.

VENTILATION: Vent to keep temperatures and humidity levels down.

FUNGICIDES: Preventative fungicide every 3-4 weeks for Pythium. Crop is also sensitive to Erwinia.

CROP TIME: 10-14 weeks in 4" to 4.5" pots. (May take up to 16 weeks with very cool, low light conditions.)

SPACING: 5" pots – about 33 pots per 10 ft sq.
4" pots – about 50 pots per 10 ft sq.

GROWTH REGULATORS: Spray with Bonzi 50 ppm when the flower bud is visible between the leaves (still with no stem). In areas with very high light, you may not need any PGR for the Orange.



IRRIGATION/FERTILIZATION: Avoid excess irrigation when plants are young. Feed with complete, balanced fertilizers at 250 ppm nitrogen (CLF). E.C. of 2.5 is optimum. Alternate with calcium nitrate on a regular basis. Provide complete minor element program. Use of Osmocote® or other appropriate slow-release fertilizer products may be beneficial in supplementing a CLF program, especially if growing under field conditions, and may provide improved performance for the consumer. Sunscapes Daisies may turn yellow along leaf margins if excess sodium is present in water supply or fertilizer mixes. Additional calcium can help counter these symptoms. Provide periodic clear water applications if excess soluble salts accumulate.

TEMPERATURE/HUMIDITY: Establish crop at 60-65°F/15-18°C average temperatures. Once established, grow at: 50-70°F (10-21°C) day temperatures and 40-60°F (5-15°C) night temperatures. Low night temperatures encourage flowering. Provide good air circulation at all times. Maintain relative humidity below 70% to prevent diseases like Botrytis gray mold.

LIGHT: Bright light is ideal for this crop. Retractable roof greenhouses and field production are suggested. Provide a minimum of 5,000-6,000 foot candles/ 53,800-64,600 lux. In low light regions, the Side Series Osteospermum blooms earlier than other cultivars. Sunscapes Daisies are not photoperiodic but bloom quicker under long day conditions. Use of supplemental light (14-16 hours, beginning at midnight) is beneficial for early spring flowering.

PINCHING: Pinch out growing tip 1-2 weeks after transplanting once a good root system is established. For 4" pots and baskets, pinch to 4-5 nodes. For 6" pots or larger, pinch to 6-7 nodes.

SPACING: Plants can be established pot-tight but should be spaced before foliage touches. Cultivars with a spreading growth habit can be grown closer together to force a more upright form. Spacing required for production:
4" pots: 8-9" centers
6" pots/1 gal: 14" centers
8" pots: 24" centers

PLANT GROWTH REGULATORS (PGRS): Cold temperatures and high light are the best control methods for preventing stretch. Chemical growth regulators can be used to maintain crop growth. Applications should be made before flower buds are visible. Spray applications of B-Nine® at 2500 ppm have worked well during the first 3-4 weeks after pinch. Avoid higher rates that delay flowering or later applications that can cause changes in the flower presentation. Drench applications of Cycocel® at 3000 ppm can be used for growth control. Apply the solution volume based on growing container size and label directions. Complete application before visible bud. Spray applications of Cycocel at 750 ppm may also be used to control height. Using sprays will require 2 or 3 applications starting after pinch and through visible bud stage.

INSECTS: Aphids, Caterpillars, Fungus gnats, Spider mites, Thrips, Whiteflies.

DISEASE: Botrytis (gray mold), Root and stem rots, Viruses.

When grown in protected greenhouse environments, insect and disease pressures are less than with field production.

CROP SCHEDULING

Product Form	# of cuttings per pot	Weeks to establish	Weeks growth before cold*	Weeks to flower	Total Crop Time (weeks)
4"	1	1-2	0	10-12	11-14
6" / 1 gallon	1	1-2	1	10-12	12-15
8" / 5gal	3	2-3	2-3	10-12	14-18
10" basket	3	1-2	1	10-12	12-15
Patio trees	1	8-10	1-2	10-12	20-22

*a minimum of 4-5 weeks cold temperature, 40-50°F/5-10°C, vernalization is required to initiate flower buds.

Note: In low light regions, Side Series Osteospermum will bloom earlier than other cultivars.

USAGE

GROWER: Ideal early spring crop in multiple container sizes. Can be grown compatibly with other 'cool' crops like pansies, perennials, cyclamen and regal geraniums.

CONSUMER: Gardens, patio pots and mixed planters.

Osteospermum

Information courtesy of Ecker Ranch

HABIT: Mounding

VIGOR: Medium to Vigorous

TEMPERATURE: Cold/55° average

TIMING: 12-14 weeks

APPLICATION: 4" – 8" pots, hanging baskets

MEDIA: Sterile, well-aerated mixes are best. Optimum pH range is between 5.5 and 6.3. Consider that the water-holding capacity that is best for consumer performance may be greater than what is ideal for production. Adjust components of mix for greenhouse or field container production as appropriate.

Petunia **Cascadias™, Littletunia™, Ray™**

Information courtesy of Danziger

PLANTING: For 4" (10 cm) pot, use 1 plant per pot. Ready for sales (from rooted cutting) within 6-8 weeks. For 6" (15 cm) pot, use 1-2 plants per pot. Ready in 8-10 weeks. For 10" (25 cm) hanging baskets, use 3 - 4 plants. Ready in 10-12 weeks.

PINCHING: Should be pinched once, 2 weeks after planting. Second pinch is recommended for baskets. May be cut instead of pinched.

FOLLOWING TRANSPLANT: During the first 2-3 weeks use water and fertilize moderately E.C. 1.5 -1.8. Allow roots to reach the side of the container before increasing water and fertilization.

LIGHT INTENSITY: High light intensities, preferably full sunlight is essential for optimum finish (min. 6,000 fc / 60,000 lux). If shaded, the plant will appear stretched and less blooming. During winter supplement lighting is required.

TEMPERATURE: Day: 64-75°F (18-24°C) night: 55 - 64°F (13- 18°C) can grow in temperatures out of this range - nearly freezing point and up to 95°F (35°C).

FERTILIZATION: Vegetative Petunia requires heavy fertilization. Apply a constant feed program with a balanced fertilizer N:P:K=2:1:2, using 250-300 ppm Nitrogen (micronutrients in average levels with iron slightly higher).

IRRIGATION: Keep well watered. Sensitive to water surplus. Drip irrigation is recommended. Leach periodically to prevent salt accumulation.

MEDIUM: Use a well-drained peat/perlite disease-free potting mix. pH 5.5 -6.0, EC 0.8-1.2.

GROWTH REGULATORS: Optional. Not necessary under high light intensities. 1-3 sprays of ALAR (B-Nine) 2 gr/L according to required plant size. Bonzi is an effective regulator for 4" pot production.

DISEASES & PEST CONTROL: Insects: White Flies, Leaf Miners and Aphids. Diseases: Botrytis, Pythium, Crown Rot. Plant liners at soil level - not too deep. Avoid excessive moisture on foliage. A standard preventive spray program should be applied to control pests and diseases. Viral diseases can be a serious problem; therefore, it is essential to start with virus-free material. All Danziger's Petunias cuttings are derived from culture and virus-free stock.



Primula

Information courtesy of Goldsmith Seeds

Time Frame when plants are receptive to flower initiation: 8 – 10 leaves present.

Flowering Type: Facultative Long Day Plant – long days enhance flowering.

Specific Flowering Mechanism: Maturity and irradiance (12 – 15 moles) trigger flowering.

TRANSPLANT READY: 6 – 8 weeks from a '288' plug tray.

FINISH BULKING/FLOWER INITIATION: Optimum conditions during the vegetative period, beginning at transplant, are needed for the roots to reach the edge of the container AND to make the plant receptive to flower initiation.

MEDIA: • pH: 5.5 – 5.8
• EC: 1.0 – 1.5

LIGHT: Provide 3000 – 4000 foot candles (12 – 15 total moles or 30,000 –40,000 lux) to hasten flower development. Long days may enhance growth. Avoid direct sunlight as leaf scorch may occur. NOTE: do not allow light level to exceed 3500 foot candles (35,000 lux) for an extended length of time.

TEMPERATURE: Days 50° – 55°F (10° – 12°C); Nights 55° – 60°F (12° – 16°C) with a negative DIF of 5° – 10°F (1° – 3°C) from 5:00 – 9:00 a.m. Average Daily Temperature (ADT): 54°F (12°C)

MOISTURE: Alternate between moisture level moist (3) and medium (2). Allow soil to reach level (2) before re-saturating to level (3).

HUMIDITY: 40 – 70%

DEHUMIDIFY: Provide horizontal airflow to aid in drying down the media through evapotranspiration, allowing better penetration of oxygen to the roots.

FERTILIZERS: Finish plants with an N:K ratio of 1:3. In cool weather, maintain low ammonium levels to avoid excessive vegetative growth and root-rot problems. Alternate with calcium-based and nitrate-based fertilizers (12-4-20 at 100 – 150 ppm Nitrogen, 14-4-14 at 100 – 150 ppm Nitrogen).

GROWTH REGULATORS: If grown cool, PGR's should not be necessary. If needed, apply B-Nine (daminozide) spray at 2500 – 5000 ppm.

FERTILIZER: Potassium nitrate at 150 ppm Nitrogen.

COMMON DISEASES: Ramularia and Botrytis. Provide adequate ventilation between plants and avoid over-saturated conditions. Apply fungicides as needed according to label rates and directions.

COMMON PESTS: Cutworms, Whitefly, Fungus Gnats, Shore Flies, Leafminers, Aphids and Thrips. Scout plants on a regular basis and apply appropriate pesticides according to label rates.

SCHEDULING: Traditionally, Primrose is sown in July. 'Primera' is an early season variety for blooming October – January. 'Orion' is a mid season variety for blooming December – March.

PRODUCT USE: Beds and borders during cool season months. Primrose is a novelty blooming plant in winter months.

Ranunculus Maché™

Information courtesy of Goldsmith Seeds



Time Frame when plants are receptive to flower initiation: 10 – 12 leaves are present.

FLOWERING TYPE:

Obligate Long Day Plant – Long days required for initiation.

SPECIFIC FLOWERING MECHANISM:

Days greater than 13.5 hours with high irradiance (15 – 20 moles) will induce and enhance flowering.

High quality Ranunculus is best obtained with cool night temperatures and short day conditions. Low temperatures and high light levels will result in large flowers with an intense color. Bloom stems will increase in height as the days get longer in early spring. Careful monitoring of watering, proper temperature management and good ventilation are the tools needed to produce a healthy plant.

FINISH BULKING/FLOWER INITIATION:

Optimum conditions during the vegetative period, beginning at transplant, needed for the root to reach the edge of the container; AND to make the plant receptive to flower initiation.

MEDIA:

Select a porous media that drains well. This is important during the cool season when temperatures and light levels are low, and media is slow to dry.

- pH: 6.0 – 6.5
- EC: 0.5 – 1.0

LIGHT:

Ranunculus initiates the highest flower count and the best growth under the natural days for spring production. Day length extension in combination with high light will promote earlier flowering.

TEMPERATURE:

After transplanting, maintain 58° – 62°F (14° – 16°C) for 2 weeks or until the roots are well developed and foliage has reached the edges of pots. Once established, lower night temperatures to 40° – 50°F (5° – 10°C) with 50° – 60°F (10° – 15°C) days. Temperatures above 68°F (20°C) may reduce vegetative growth, increase stem length and speed up flowering. High temperatures in combination with long days will stimulate corm formation or promote leaf yellowing.

MOISTURE:

Alternate between moisture levels wet (4) and medium (2). Allow media to approach level (2) before re-saturating to level (4). It is critical to water early in the day to allow foliage to dry quickly before nightfall. Rapid drying of the foliage will discourage disease outbreaks. Avoid overhead watering. Cool temperatures and wet foliage may promote Botrytis infections. Yellow leaves are indicative of drought water stress conditions.

HUMIDITY:

40 – 70%

DEHUMIDIFY:

Provide horizontal airflow to aid in drying down the media through evapotranspiration, allowing better penetration of oxygen to the roots.

FERTILIZERS:

Ranunculus is a moderate to heavy feeder. Once plants are established, constant liquid feed at an EC rate of 1.5 with a calcium-based fertilizer (14-4-14). After flower buds are visible, apply an extra fertilization of potassium nitrate at an EC rate of 2.0 – 2.4 every 2 weeks. During cool weather production, ammonium based feeds (20-10-20) may encourage root rot problems and stretching to occur.

GROWTH REGULATORS:

'Maché' is responsive to B-Nine (daminozide) at 2500 ppm. Apply first treatment when flower buds are visible in the crown. A second application is made when flower stems are 2 inches (4 – 5 cm) in length. If needed, subsequent applications can be applied until flowers begin to open.

COMMON DISEASES:

Pythium Root Rot, Botrytis, Tomato Spotted Wilt Virus

COMMON PESTS:

Aphids, Whitefly, Leafminer, Thrips, Fungus Gnats

SCHEDULING:

Ranunculus is traditionally sown in August/September for January/February sales. Additional crops can be sown in September/October for March/April sales.

TRANSPLANT TO FINISH CROP TIME:

4 inch crop: 12 – 15 weeks
6 inch crop: 13 – 16 weeks

PRODUCT USE:

Pots, containers, mass plantings, gift item, garden cut flowers

Regal Geraniums

Elegance™ Series

Information courtesy of Ecke Ranch

PRODUCT FORMS AVAILABLE:

- Single root cuttings (which are budded but not pinched) are good for 4.5" to 5.5" pots.

FINISHING OF PRE-BUDDED REGAL GERANIUMS (all product forms) - Cuttings should be transplanted into final container and spaced into the finishing environment. Grow 6" pots at 1 pot per square foot. 4.5" and 5.5" pots at 2½ pots per square foot.

• **Temperature:** Maintain 59°F (15°C) nights and 65°F (18°C) days. If you have heated floors run the soil temperature at 60°F.

• **Fertility:** Supply 200 to 250 ppm nitrogen and potassium constant liquid feed, using a balanced liquid fertilizer complete with micronutrients. Periodic applications of Epsom salts are also beneficial. Maintain EC below 1.0 mmhos. Regals are sensitive to excess soluble salts. If EC is above the recommended range, do not allow the plants to dry excessively. If the EC is below 1.0 mmhos, plants should be allowed to dry slightly between irrigations. Soil pH should range from 5.0-6.0.

• **Lighting:** Regals are light accumulators; high light levels and long days will enhance flowering. Provide 16 hour days September 15th through April 1st. These lights should supply a minimum of 10 foot candles at plant level (similar to Mum lights). Shade if light levels exceed 3,800 f.c., until the plants begin to show color. At this time, light levels should be reduced to 2,500 f.c to extend the longevity of the flowers.

• **Moisture Management:** Until the first bud appears, the plant should be allowed to dry between irrigations to control vegetative growth. As flowers begin to develop, irrigation frequency should increase to avoid problems with flower bud abortion.

• **Height Control:** If plants are grown under adequate light levels, with moderate moisture and cool nights, height control should not be necessary. If needed, Regals will respond to Cycocel®. Apply Cycocel at 1,500 to 3,000 ppm as a spray until the buds begin to elongate. Cycocel can be applied at 7-14 day intervals. If this is the first time working with Cycocel on Regals test the application on a small number of plants first and always consult the label for further instructions.

• **Insect and Disease Concerns:** Whiteflies can be a concern on a Regal crop. Monitor populations using yellow sticky cards, and make necessary insecticide applications to control populations prior to flower development. Botrytis is also a major concern at all stages of the crop. Maintain relative humidity below 70% in the finishing environment, and provide good air circulation and ventilation. Water plants early in the day, and avoid overhead irrigation. Weekly fungicide sprays are beneficial for prevention of botrytis.

CROP TIMING* FOR VARIOUS PRODUCT FORMS:

- Single budded cutting 8-10 weeks

*Crop timing will vary depending on temperatures and light levels. Crop timing will be extended without the use of supplemental lighting if the crop is scheduled for production during the months between September 15th and April 1st.

SHIPPING INFORMATION: Regals are very sensitive to ethylene in transit. Leaf yellowing and bud abortion may occur if time in transit is prolonged. For best results, ship plants with one or two open flowers and use Ethylblock.

Seed Geraniums

Information courtesy of Goldsmith Seeds

FLOWERING

Time Frame when plants are receptive to flower initiation:
Days 18 – 24; 4 – 6 leaves present.

Flowering Type:
Geraniums are Day-neutral plants.

Specific Flowering Mechanism:
Light and temperature trigger flowering. Geraniums are light accumulators, the more light received, the faster the growth and earlier the flowering. DIF treatments may negate flowering.

GROWING ON

NOTE: 'Multibloom' culture is slightly different than typical Geraniums. 'Multibloom' will set bud in 6 – 7 weeks from sowing. Therefore, it is necessary to keep 'Multibloom' actively growing. Do not stress 'Multibloom' by withholding water or fertilizer. Otherwise, the culture remains the same for all Geraniums.

FINISH BULKING/FLOWER INITIATION:

Optimum conditions during the vegetative period, beginning at transplant, needed for the root to reach the edge of the container; AND to make the plant receptive to flower initiation.

MEDIA:

- pH: 6.2 – 6.5. Low pH symptoms include yellowing of leaves, interveinal chlorosis and necrosis.
- EC: 1.2 – 1.5 High salts may encourage roots to become very brittle.

LIGHT:

Provide 3500 – 4500 foot candles (15 – 20 total moles or 35,000 – 45,000 lux) to hasten flower induction. Supplemental lighting under low light conditions at 350 – 450 foot candles (35,000 – 45,000 lux) will enhance shoot and root growth. Lighting after transplant for 2 – 3 week, at 300 – 500 foot candles (3000 – 5000 lux) for 14 – 18 hours a day will induce early flowering.

TEMPERATURE:

60° – 65°F (16° – 18°C) nights and 70° – 75°F (21° – 24°C) days. Manipulation of night temperatures after buds are visible can speed up or slow down flower development to meet a sales date.
Average Daily Temperature (ADT): 67°F (19°C)

MOISTURE:

Alternate between moisture levels wet (4) and moist (3). Allow media to approach level (3) before re-saturating to level (4). Excessive drying of the media moisture level will concentrate salts around the root system and burn the root hairs. Symptoms of excessive drying include lower leaves turning reddish to yellow, and root tip die-back.

DEHUMIDIFY:

Provide horizontal airflow to aid in drying down the media through evapotranspiration under cool, low light conditions.

FERTILIZERS:

Constant liquid feed at 200 ppm Nitrogen with a calcium-based fertilizer (13-2-13 or 14-4-14).

GROWTH REGULATORS: A total of 4 – 5 applications of Cycocel (chlormequat chloride) at 750 ppm beginning when 3 – 5 true leaves are present will control growth. NOTE: Do not apply Cycocel after the buds have emerged above the foliage. Small and/or malformed flowers will result from late applications of Cycocel. Also responds to A-Rest (ancymidol), Bonzi (paclobutrazol), Sumagic (uniclazonol) or B-Nine/Cycocel (chlormequat chloride) tank mix.

COMMON DISEASES:

Botrytis, Pythium, Alternaria, Pseudomonas, Rust

COMMON PESTS:

Thrips

SCHEDULING:

Elite, Maverick, BullsEye

TRANSPLANT TO FINISH CROP TIME: 4" crop: 7 – 10 weeks
6" crop: 10 – 12 weeks

SCHEDULING:

Multi Bloom

TRANSPLANT TO FINISH CROP TIME: Packs: 6 – 7 weeks
4" crop: 6 – 8 weeks

PRODUCT USE:

Pots, containers, mass plantings. 'Multibloom' and 'Elite' can also be used in packs.

Sunpatiens

Information courtesy of Ecke Ranch

Habit: Upright (Compact) Spreading (Spreading series)
Vigor: Medium (Spreading / Compact)
Temperature: 68°F (20°C) avg.
Timing: 8-10 weeks

APPLICATION:

- Quart (Compact series)
- 1 gallon (Spreading series)
- Hanging Baskets (All series)
- Transplant as soon as they are ready. Cuttings will stretch if left in propagation trays which can result in poor basal branching of the finished product!

Sunpatiens **do not grow like regular impatiens**. They provide the opportunity to shorten production time. They perform best with an aggressive grow schedule, more light, warm temperatures, and early spacing.

MEDIA:

- Sterile, well-aerated mixes are best.
- Optimum pH range is between 5.8 and 6.2.
- Consider that the water-holding capacity that is best for consumer performance may be greater than what is ideal for production.

WATER QUALITY/IRRIGATION:

- E.C. below 1.0 mmhos is best.
- Avoid excess irrigation when plants are young.
- Maintain even soil moisture once plants are established.
- Leaf scorch may occur if mature plants are allowed to dry out and wilt – especially when relative humidity in the growing area is low.

FERTILIZATION:

- Feed with balanced fertilizers at 200 ppm nitrogen (CLF). E.C. of 2.0.
- Avoid fertilizers high in ammoniacal nitrogen.
- Use of Osmocote® products, such as 18-6-12, or other appropriate slow-release fertilizers, may be beneficial in supplementing a CLF program and may provide improved performance for the consumer.
- Provide periodic clear water applications if excess soluble salts are detected.

TEMPERATURE AND HUMIDITY:

- SunPatiens grow well under a wide range of temperatures, but will grow fastest when temperatures are warm.
- Establish crop at an average temperature of 68-70°F (20-21°C) for 10-14 days.
- Once established, grow at 65-85 ° F (18-30 ° C) day temperatures and 60-68 °F (16-20°C) night temperatures.
- Provide good air circulation at all times.
- Maintain relative humidity below 70% to help prevent diseases like Botrytis gray mold.

LIGHT:

- Establish and grow SunPatiens with as much light as possible.
- Avoid hanging plants above the crop which shade and drip on the SunPatiens.
- Provide light shade only if light intensities result in greenhouse temperatures above 85°F/29°C.
- 3,000 foot candles of light is ideal during the establishing phase.
- Once established, increase light levels to 5,000+ foot candles (53,800+ lux) if possible.
- SunPatiens can be finished under low light conditions, but the number of flowers will be reduced and internode stretch will be increased.
- SunPatiens can also be produced outdoors under full sun, but be careful to acclimate them to the higher light environment to avoid leaf scorch. One week at 5,000 f.c. is sufficient before moving them to full sun.

PINCHING - NOT RECOMMENDED!

- In general, pinching is not recommended for SunPatiens.
- Pinching may delay flowering by 1-2 weeks and often results in a low, horizontal branching pattern.

HEIGHT CONTROL AND PLANT GROWTH REGULATORS:

- Adequate spacing between plants, careful moisture management, and high light levels are the best way to control stretch on SunPatiens.
- If needed, SunPatiens respond well to Bonzi® and B-Nine
- Discontinue all plant growth regulators 2-3 weeks prior to finish. Late applications will distort and possibly abort flower buds.

SPACING:

- Plants can be established pot-tight but should be spaced once foliage touches.
- Do not delay spacing, as SunPatiens tend to stretch rapidly in response to competition for light!
- 6" or 1-gal. pots should be provided a minimum of 10-12" centers (approximately 0.75 per sq. ft.).
- 8" pots should be spaced at 12-14" centers.
- 10" pots should be spaced at 14-16" centers.

INSECT AND DISEASE CONCERNS:

Insects

- Aphids
- Caterpillars
- Fungus Gnats
- Thrips
- Japanese Beetles

Diseases

- Bacterial Leaf Spotting
- Viruses
- Botrytis
- Root and Stem Rots

CROP SCHEDULING FROM TRANSPLANT:

Product Form	Liners per container	North (Early Spring)	South (Early Spring)	North (Spring)	South (Spring)
1 gallon (2.6 qt.)	1	10 weeks	10 weeks	10 weeks	10 weeks
Hanging Basket	3	10 weeks	10 weeks	8 weeks	8 weeks
Hanging Basket	1	12 weeks	12 weeks	10 weeks	10 weeks
Quarts	1	10 weeks	10 weeks	8 weeks	8 weeks

**Crop time is reduced under warmer growing conditions. SunPatiens Compact Orange may require an additional week to reach full-bloom.



Vinca

Information courtesy of Ron Adams, Goldsmith Seeds & Ball Horticultural

MEDIA: Use a well-drained, disease-free, soilless medium with a pH of 5.2 to 5.8 and a medium initial nutrient charge.

LIGHT: Keep light levels between 3,000 and 5,000 fc (30,000 to 50,000 lux). Shade when the light levels are above 5,000 fc (50,000 lux). Supplemental lighting under low light conditions will help flower development.

TEMPERATURE: Night: 65 to 68°F (18 to 20°C) Do not allow night temperatures to go below 65°F.
Day: 68 to 75°F (20 to 24°C) or above

WATERING: Maintain moderate moisture. A little wilting usually does not cause problems, but avoid repeated, heavy wilting. Water in the morning, to allow the foliage to dry before nightfall. Prolonged periods where the soil or leaves are wet will encourage diseases. Leach periodically to eliminate any salt build-up in the soil.

FERTILIZER: Constant feed with 100 - 150 ppm with a balanced, complete fertilizer, or feed weekly 200 - 300 ppm with a balanced, complete fertilizer. Maintain soil pH between 5.5 and 6.0.

GROWTH REGULATORS (USE ONE): Always follow the product label.
B-Nine: 2,500 to 5,000 ppm spray (0.39 to 0.79 oz/gal)
A-Rest: 8 - 10 ppm spray (3.9 to 4.8 fl oz/gal)
Bonzi, Piccolo or Paczol will cause black, disease-like spots on the foliage.

DISEASES/RECOMMENDED FUNGICIDES: Always follow the label.
Pythium root rot - Soil Drench with Subdue MAXX or Hurricane
Rhizoctonia - Heavy Spray or light soil drench with Hurricane, Spectro or Terraclor
Thelaviopsis - Soil drench with Terraguard, Medallion or Cleary's 3336
Botrytis - Foliar spray with Daconil, Decree, Dithane, Endorse or Chipco Daconil. Can burn flowers.

PINCHING: Pinching is not necessary.

SPACING: 4 inch pots - Can be grown pot-tight
6 inch pots - 4 to 6 inches between pots
8 inch pots - 6 to 8 inches between pots

COMMON PESTS: Thrips, Aphids, Fungus Gnats

General Crop Scheduling Guidelines

FROM A 512 PLUG		
SIZE	TIME	PLUGS/POT
Pack	6-8 wks to finish	N/A
4" Pot	7-9 wks to finish	3-4 plugs
6" Pot	8-10 wks to finish	5-6 plugs
8" Pot	8-10 wks to finish	6-8 plugs

FROM A 288 PLUG		
SIZE	TIME	PLUGS/POT
Pack	5-7 wks to finish	N/A
4" Pot	6-8 wks to finish	2-3 plugs
6" Pot	7-9 wks to finish	4-5 plugs
8" Pot	7-9 wks to finish	5-6 plugs

FROM A 144 PLUG		
SIZE	TIME	PLUGS/POT
4" Pot	6-8 wks to finish	1 plug
6" Pot	7-9 wks to finish	3-4 plugs
8" Pot	7-9 wks to finish	4-6 plugs

Zinnia *hybrida & angustifolia*

Information courtesy of Ron Adams & Goldsmith Seeds

Crystal, Profusion, Solcito, Starbright

TRANSPLANTING:
Do not hold plugs before transplanting. Rootbound plugs do not root out or grow out well.

MEDIA:
Use a well-drained, disease-free, soilless medium with a pH of 5.8 to 6.2 and a medium initial nutrient charge.

LIGHT:
Do not shade Zinnias. High light will improve crop quality (6,000 fc or higher). Supplemental light in low light conditions will help improve flower development.

TEMPERATURE:
Night: 60 to 65°F (15 to 18°C)
Day: 70 to 85°F (21 to 29°C)

WATERING:
After the plug has begun to root out, allow soil to dry down well between waterings. Water in the morning, to allow the foliage to dry before nightfall. Prolonged periods where the soil or leaves are wet will encourage diseases.

FERTILIZER:
Constant feed with 50 to 100 ppm Nitrogen with a calcium-based fertilizer (13-2-13 or 14-4-14), or feed weekly with 200 ppm Nitrogen with a calcium-based fertilizer (13-2-13 or 14-4-14). Alternate waterings with clear water and 100 ppm will help with growth control.

GROWTH REGULATORS (Use one) - Always follow the label.
B-Nine - 2,500 to 5,000 ppm spray (0.39 to 0.79 oz/gal)
Bonzi/Piccolo/Paczol - 10 to 30 ppm spray (0.32 to 0.96 fl oz/gal)
B-Nine + Cycocel - 2,500 ppm (0.39 oz/gal) + 1,000 ppm Cycocel (1.08 fl oz/gal) applied as a tank-mix spray

PINCHING:
Pinching is not recommended.

SPACING:
4 inch pots - 2 to 4 inches between pots.
6 inch pots - 4 to 6 inches between pots.

DISEASES/RECOMMENDED FUNGICIDES - Always follow the label.
Zinnias are prone to leaf spots and a number of diseases, and should be put on a regular fungicide program. Below are some recommendations.

- Every 10 to 14 days, apply a fungicide rotating the following groups - use one.
 1. Heritage, Insignia, Compass-O, or Cygnus
 2. Phyton 27 (not recommended for product with flowers)
 3. Daconil (not recommended for product with flowers)
 4. Dithane, Fore, or Protect
 5. Eagle or Banner MAXX

Powdery Mildew - Foliar Spray with Compas-O, Cygnus, Heritage or Phyton 27
Botrytis Blight - Foliar Spray with Dithane, Daconil, Decree, or Endorse
Bacterial Leaf Spot - Foliar Spray with Phyton 27 or Kocide

COMMON PESTS
Aphids, Whitefly, Thrips, Mites

GENERAL CROP SCHEDULING GUIDELINES for ZINNIA hybrida & augustifolia:

FROM A 512 PLUG		
SIZE	TIME	PLUGS/POT
Pack	5-7 wks to finish	1 plug

FROM A 288 PLUG		
SIZE	TIME	PLUGS/POT
Pack	4-6 wks to finish	1 plug
4" Pot	5-7 wks to finish	1 plug

FROM A 144 PLUG		
SIZE	TIME	PLUGS/POT
4" Pot	4-6 wks to finish	1 plug
6" Pot	5-7 wks to finish	2-3 plugs

Zinnia elegans

Information courtesy of Ron Adams & Goldsmith Seeds

Dreamland, Magellan, Swizzle, Zowie, Uproar

TRANSPLANTING:

Do not hold plugs before transplanting. Rootbound plugs do not root out or grow out well.

MEDIA:

Use a well-drained, disease-free, soilless medium with a pH of 5.8 to 6.2 and a medium initial nutrient charge.

LIGHT:

Do not shade Zinnias. High light will improve crop quality (6,000 fc or higher). Supplemental light in low light conditions will help improve flower development.

TEMPERATURE:

Night: 60 to 65°F (15 to 18°C)

Day: 70 to 85°F (21 to 29°C)

WATERING:

After the plug has begun to root out, allow soil to dry down well between waterings. Water in the morning, to allow the foliage to dry before nightfall. Prolonged periods where the soil or leaves are wet will encourage diseases.

FERTILIZER:

Constant feed with 50 to 100 ppm Nitrogen with a calcium-based fertilizer (13-2-13 or 14-4-14), or feed weekly with 200 ppm Nitrogen with a calcium-based fertilizer (13-2-13 or 14-4-14). Alternate waterings with clear water and 100 ppm will help with growth control.

GROWTH REGULATORS (Use one) - *Always follow the label*

B-Nine - 2,500 to 5,000 ppm spray (0.39 to 0.79 oz/gal)

Bonzi/Piccolo/Paczol - 15 to 45 ppm spray (0.32 to 0.96 fl oz/gal)

B-Nine + Cycocel - 2,500 ppm (0.39 oz/gal) + 1,000 ppm Cycocel (1.08 fl oz/gal) applied as a tank-mix spray

PINCHING: Pinching is not recommended.

SPACING:

4 inch pot - 2 to 4 inches between pots.

6 inch pot - 4 to 6 inches between pots.

DISEASES/RECOMMENDED FUNGICIDES - *Always follow the label*

Zinnias are prone to leaf spots and a number of diseases, and should be put on a regular fungicide program. Below are some recommendations.

- Every 10 to 14 days, apply a fungicide rotating the following groups - use one.
 1. Heritage, Insignia, Compass-O, or Cygnus
 2. Phyton 27 (not recommended for product with flowers)
 3. Daconil (not recommended for product with flowers)
 4. Dithane, Fore, or Protect
 5. Eagle or Banner MAXX

Powdery Mildew - Foliar Spray with Compas-O, Cygnus, Heritage or Phyton 27

Botrytis Blight - Foliar Spray with Dithane, Daconil, Decree, or Endorse

Bacterial Leaf Spot - Foliar Spray with Phyton 27 or Kocide

Alternaria Leaf Spot - Foliar Spray with Chipco, Heritage, Systhane or Terraguard

COMMON PESTS:

Aphids, Whitefly, Thrips

GENERAL CROP SCHEDULING GUIDELINES:

FROM A 512 PLUG		
SIZE	TIME	PLUGS/POT
Pack	6-8 wks	N/A
4" Pot	7-9 wks	2-3 plugs
6" Pot	7-9 wks	4-5 plugs
8" Pot	7-9 wks	4-5 plugs

FROM A 288 PLUG		
SIZE	TIME	PLUGS/POT
Pack	5-7 wks	N/A
4" Pot	6-8 wks	1 plug
6" Pot	6-8 wks	3-4 plugs
8" Pot	6-8 wks	4-5 plugs

FROM A 144 PLUG		
SIZE	TIME	PLUGS/POT
4" Pot	5-6 wks	1 plug
6" Pot	6-8 wks	2-3 plugs
8" Pot	6-8 wks	3-4 plugs



Combo Kits

Follow patterns provided for plants per pot.

**** PINCHING WEEK NUMBERS**
See note on page 191.

*** GROWTH REGULATOR**
See note on page 191.

Combo Kit	Pot Size	Grow Time in Weeks	Soil pH	Temperature (degrees F)	Light	Fertilizer	Pinching**	Growth Regulator	Notes
Blues Mix Early Sunrise Evening Twilight Old Glory Calibrachoa	12" Basket	14-16	5.5 - 5.8	60-70 Day 55-60 Night	Full Sun	200-300 ppm N	Pinch week 4. To get a higher quality product, pinch again on week 8.	After last pinch use Bonzi at 10 to 30 ppm or give a soil drench at 3 ppm for longer lasting control. *	Do not over water. These are susceptible to root rot.
Creamsicle New Guinea Impatiens, Bacopa, Hedera	12" Basket	11-14	6.2 - 6.5	65-75 Day 60-65 Night	Partial Shade	100-150 ppm N	Pinch Bacopa and Hedera on week 2; then pinch Bacopa again on week 7.	If needed use one application of B-Nine 2500 ppm to help control Bacopa.	Remove early flowers on the New Guinea to help give more plant body.
Dallas Trixie Lantana, Verbena, Ipomea	14 - 16" Tubs	10-14	5.5 - 5.8	65-75 Day 60-65 Night	Full Sun	150-250 ppm N	Pinch all on week 2 and again on week 6.	Can use a soil drench of Bonzi 3 ppm once they are gaining good size after last pinch. *	If needed remove early flowers on the Verbena.
Flamenco Dancer Geranium-Interspecific, Petunia, Ipomea	10 - 12" Planter	10-14	5.5 - 5.8	65-75 Day 60-65 Night	Full Sun	150-200 ppm N	Interspecific week 2; Petunia week 5	Can use spray of Bonzi 5 ppm to control size if needed	Recommend not pinching the Ipomea
Flames of Summer Geranium-Interspecific, Euphorbia, Nemesia, Calibrachoa	12 - 14" Basket	10-14	5.5 - 5.8	65-75 Day 60-65 Night	Full Sun	150-200 ppm N	Euphorbia and Interspecific week 2; Nemesia as needed until 4 weeks before shipping; Calibrachoa week 0 & 4	Can use spray of Bonzi 5 ppm to control size if needed	May need to treat Nemesia with a general fungicide.
Frosted Plums Wave, Licorice	12" Basket	11-14	5.5 - 5.8	60-70 Day 55-60 Night	Full Sun	200-300 ppm N	Pinch licorice week 1 then pinch all week 7.	Use a soil drench of Bonzi 5 ppm after last pinch. *	Purple Wave needs long days to bloom.
Glowing Silver Begonia, New Guinea, Dichondra	13 - 14" Planter	12-15	6.2 - 6.5	65-75 Day 60-65 Night	Partial Shade	100-150 ppm N	Trim dichondra if too long.	None needed.	Recommend removing leaves on the Gryphon as needed instead of PGR.
Just Peachy Double Impatiens, Lobelia, Lamium	10" Bowl or Basket	8-10	6.2 - 6.5	65-75 Day 60-65 Night	Partial Shade	100-200 ppm N	Pinch Double Impatiens week 1 then give Lobelia and Lamium a pinch about week 2.	Can spray with Bonzi 10 ppm if needed to control size.	If needed remove early flowers on the Double Impatiens.
Mystic Star Salute Sweet Dreams Easy Wave Petunia	10" Basket	8-12	5.5 - 5.8	60-70 Day 55-60 Night	Full Sun	200-300 ppm N	Pinch week 5.	Use a soil drench of Bonzi 3-5 ppm after pinch. *	Use 2 plants of each color for 12" or larger baskets.
Parading the Colors Zonal, Bacopa, Lobelia	12" Basket	10-14	6.2 - 6.5	65-75 Day 60-65 Night	Full Sun to Part Shade	100-200 ppm N	Pinch Bacopa and Lobelia week 1, pinch Zonals week 2, and pinch Bacopa and Lobelia again week 5.	If needed use one application of B-Nine 2500 ppm to help control Bacopa and Lobelia.	Remove early flowers on the Zonals to help give more plant body.
Pink Fountain Solenia, Heuchera, Gaura	10" Planter	8-10	5.5 - 5.8	65-75 Day 60-65 Night	Partial Shade	150-200 ppm N	Pinch Solenia and Gaura on week 2.	Can use spray of Bonzi 5-10 ppm if needed to control size.	Do not over growth retard the Solenia Begonia.
Poolside Party Wave, Scaevola, Osteo, Verbena	12" Container	10-14	5.5 - 5.8	60-70 Day 55-60 Night	Full Sun	200-300 ppm N	Pinch Scaevola and Verbena on week 1; then pinch Wave Petunia, Scaevola and Verbena on week 5.	Use a spray of Bonzi 10-20 ppm if needed to control size. Can use a spray of B-Nine 2500 ppm/Cyco-cel 1000 ppm to control height on Osteospermum.	Keep high light levels and cool night temperatures for growth control and good flowering in the Osteospermum.
Rosy Dawn Wave, Calibrachoa, Lobelia	12" Basket	10-14	5.5 - 5.8	65-75 Day 60-65 Night	Full Sun	200-300 ppm N	Pinch Calibrachoa and Lobelia week 1; then pinch all week 6.	Use a soil drench of Bonzi 3-5 ppm after last pinch. *	
Royal Velvet Solenia, Rex, Bacopa, Cordylone	14 - 16" Container	11-14	5.5 - 5.8	65-75 Day 60-65 Night	Partial Shade	100-200 ppm N	Pinch Solenia and Bacopa on week 2, then pinch Bacopa again on week 7.	If needed can use one application of B-Nine 2500 ppm to help control Bacopa.	Do not over feed. The Rex Begonias are sensitive to high light and salt build up.

Combo Kit	Pot Size	Grow Time in Weeks	Soil pH	Temperature (degrees F)	Light	Fertilizer	Pinching**	Growth Regulator	Notes
Seaside Resort Browallia, Duranta, Diascia, Ipomea	12 - 14" Planter	11-14	5.5 - 5.8	65-75 Day 60-65 Night	Full Sun	150-200 ppm N	Browallia week 3; Diascia week 3 and 6.	Can use a spray of 10-30 ppm Bonzi to spot spray Browallia. Be careful not to over-PGR Diascia.	May need to treat Diascia with a general fungicide.
Simple Elegance Zonal, Euphorbia, Juncus	10 - 12" Planter	10-14	6.2-6.5	65-75 Day 60-65 Night	Full Sun	100-200 ppm N	Zonal week 2; Keep pinching Euphorbia as needed until 4 weeks before ship.	Can use spray of Bonzi 5 ppm to control size if needed.	Remove early buds or flowers on Zonals to help give more plant body.
Solar Flare Coleus, Calibrachoa, Osteo	10 - 12" Planter	10-14	5.5 - 5.8	60-70 Day 55-60 Night	Full Sun	150-250 ppm N	Pinch Osteospermum, Coleus, and Calibrachoa on week 1, then pinch Coleus and Calibrachoa again on week 6.	Can use a spray of Bonzi 10-30 ppm if needed to control size.	Keep high light levels and cool night temperatures for growth control and good flowering in the Osteospermum.
Spring has Sprung Wave, Ipomea, Lobelia	12" Basket	10-13	5.5 - 5.8	65-75 Day 60-65 Night	Full Sun	200-300 ppm N	Pinch Ipomea and Lobelia week 1; then pinch all on week 6.	Use a soil drench of Bonzi 5 ppm after last pinch. *	
Spring Symphony Osteo, Viola, Lysimachia	12" Basket	10-14	5.5 - 5.8	60-70 Day 55-60 Night	Full Sun	150-200 ppm N	Pinch Lamium and Viola week 4 or 5.	Can use a spray of Bonzi 5-10 ppm if needed to control size.	Keep high light levels and cool night temperatures for growth control and good flowering in the Osteospermum.
Summer Meadow Salvia, Calibrachoa, Heuchera	10 - 12" Planter	10-14	5.5 - 5.8	65-75 Day 60-65 Night	Full Sun	150-250 ppm N	Pinch Salvia week 2; Calibrachoa Week 0 & 4.	Can use spray of B-Nine 2500 ppm/ Cycocel 1000 ppm if needed to control height on Salvia, and a spray of Bonzi 30ppm if needed to control Calibrachoa.	
Summer Sizzler Ipomea, Oxalis, Duranta, Coleus	12" Container	10-14	5.5 - 5.8	65-75 Day 60-65 Night	Full Sun	150-200 ppm N	Pinch Ipomea on week 1, pinch Coleus on week 2, and pinch Duranta and Coleus on week 6.	This combination needs to be controlled with pinching. The Oxalis is very sensitive to growth regulators.	Can remove some large leaves on Ipomea to reduce shading on other plants.
Summer Spires Angelonia, Calibrachoa, Hakonechloa	10 - 12" Planter	10-14	5.5 - 5.8	65-75 Day 60-65 Night	Full Sun	150-250 ppm N	Angelonia week 0 if not already pinched; Calibrachoa Week 0 & 4.	Can use spray of B-Nine 3800 ppm if needed to control height on Angelonia, and spray of Bonzi 30 ppm if needed to control Calibrachoa.	
Sunshine & Storm Wave, Bidens	12" Basket	10-14	5.5 - 5.8	60-70 Day 55-60 Night	Full Sun	200-300 ppm N	Pinch Bidens week 2 then pinch all week 7.	Use a soil drench of Bonzi 3-5 ppm after last pinch. *	
Sweet Simplicity Zonal, Bacopa, Vinca Vine	12" Basket	10-14	6.2 - 6.5	65-75 Day 60-65 Night	Full Sun to Part Shade	100-200 ppm N	Pinch Bacopa and Vinca Vine on week 1, pinch Zonals week 2, and pinch Bacopa again week 5.	If needed use one application of B-Nine 2500 ppm to help control Bacopa.	Remove early flowers on the Zonals to help give more plant body.
Tinkerbell Fuchsia, Double Impatiens Lobelia, Juncus	10 - 12" Planter	10-12	5.5 - 5.8	65-75 Day 60-65 Night	Partial Shade	100-200 ppm N	Pinch Double Impatiens week 3; Lobelia week 4.	Can use spray of Bonzi 10 ppm if needed to control size.	
Tropical Escape Cordylone, Begonia, New Guinea, Polemonium, Ipomea	13 - 14" Planter	10-14	6.2 - 6.5	65-75 Day 60-65 Night	Partial Shade	100-150 ppm N	Pinch Begonia week 3.	None needed.	
Winds of Change Carex, Rudbeckia, Sedum Nemesia, Ipomea	12 - 14" Planter	12-16	5.5 - 5.8	65-75 Day 60-65 Night	Full Sun	150-250 ppm N	Pinch Nemesia often; Pinch Sedum as needed.	Can use spray of Bonzi 10 if needed to control size.	
Herb Combos: Country Kitchen French Cuisine Italian Chef's Choice	12" Bowls	10-14	5.5 - 5.8	65-75 Day 60-65 Night	Full Sun	100-150 ppm N	Keep trimming herbs as needed until planter looks full. Pinch Basil hard so it doesn't get too tall.		
Succulent Combo: Mossy Places	10 - 12" Planter	18-20	5.5 - 5.8	65-75 Day 60-65 Night	Full Sun	100-150 ppm N	Pinch twice.		Give this combo a long growtime. Plant in December or January for May finish.
Succulent Combo: Here for the Duration	10 - 12" Planter	18-20	5.5 - 5.8	65-75 Day 60-65 Night	Full Sun	100-150 ppm N	Pinch Sagina and Sedum as needed.		Give this combo a long growtime. Plant in December or January for May finish.

Easy Liners

ppp = liners per pot.

** PINCHING WEEK NUMBERS

Week 0 = week of planting.
 Week 2 = 2 weeks after planting.
 Week 4 = 4 weeks after planting.
 ...and so on.

* GROWTH REGULATORS - Always follow the label.

High light levels in combination with cool temperatures will help reduce the need for growth regulators. Using a negative DIF (night temperature is warmer than the day temperature) will also help control stretch. A drench with 1 - 5 ppm Bonzi/Piccolo/Paczol (0.03 to 0.16 fl oz/gal), (concentration will vary with the season) is also very effective. Below are general guidelines.
 8" basket: 1-1½ cups per pot (of the above solution)
 10" basket: 1½-2 cups per pot
 12" basket: 2-2½ cups per pot

Easy Liner	Grow Time (in weeks)				Soil pH	Temperature (°F)	Light	Fertilizer	Pinching**	Growth Regulator	Notes
	6" 1 ppp	10" 2 ppp	12" 3 ppp	16" 4 ppp							
Bacopa	8-10	10-12	12-14	12-14	5.5 - 5.8	60-70 Day 55-60 Night	Full Sun	100 - 200 ppm N	Pinch week 2 and again week 6 for larger pots.	Should not be needed, however if more control is desired use one application of B-Nine at 2500 ppm.	Heavily wilted Bacopa will lose flowers.
Calibrachoa Bidens	9-12	12-14	12-14	12-14	5.5 - 5.8	60-70 Day 55-60 Night	Full Sun	150 - 250 ppm N	Week 3 for all pot sizes. To get a higher quality product pinch again week 6 on 10" pots or larger.	After last pinch, use Bonzi spray at 10-30 ppm or give a Bonzi soil drench at 3 ppm for longer lasting control.*	Do not overwater. These are susceptible to root rot. Recommend preventative treatment for Powdery Mildew.
Calibrachoa Lobelia Bacopa	9-12	12-14	12-14	12-14	5.5 - 5.8	60-70 Day 55-60 Night	Full Sun	150 - 250 ppm N	Week 3 for all pot sizes. To get a higher quality product pinch again week 6 on 10" pots or larger.	After last pinch, use Bonzi spray at 10 ppm. For longer lasting control, use Bonzi soil drench at 3 ppm once plants are filled out and over edge of pot.*	Do not overwater. These are susceptible to root rot. Heavily wilted Bacopa will lose flowers. Recommend preventative treatment for Powdery Mildew.
Calibrachoa Lobelia Bidens	9-12	12-14	12-14	12-14	5.5 - 5.8	60-70 Day 55-60 Night	Full Sun	150 - 250 ppm N	Week 3 for all pot sizes. To get a higher quality product pinch again week 6 on 10" pots or larger.	After last pinch, use Bonzi spray at 10-30 ppm or give a Bonzi soil drench at 3 ppm for longer lasting control.*	Do not overwater. These are susceptible to root rot. Recommend preventative treatment for Powdery Mildew.
Calibrachoa Lobelia Verbena	9-12	12-14	12-14	12-14	5.5 - 5.8	60-70 Day 55-60 Night	Full Sun	150 - 250 ppm N	Week 3 for all pot sizes. To get a higher quality product pinch again week 6 on 10" pots or larger.	After last pinch, use Bonzi spray at 10-30 ppm or give a Bonzi soil drench at 3 ppm for longer lasting control.*	Do not overwater. These are susceptible to root rot. Recommend preventative treatment for Powdery Mildew. Deadhead verbena for rebloom.
Calibrachoa Verbena Bacopa	9-12	12-14	12-14	12-14	5.5 - 5.8	60-70 Day 55-60 Night	Full Sun	150 - 250 ppm N	Week 3 for all pot sizes. To get a higher quality product pinch again week 6 on 10" pots or larger.	After last pinch, use Bonzi spray at 10 ppm. For longer lasting control, use Bonzi soil drench at 3 ppm once plants are filled out and over edge of pot.*	Do not overwater. These are susceptible to root rot. Heavily wilted Bacopa will lose flowers. Recommend preventative treatment for Powdery Mildew.
Calibrachoa	9-12	9-12	9-12	9-12	5.5 - 5.8	60-70 Day 55-60 Night	Full Sun	150 - 250 ppm N	Pinch week 4. To get higher quality product pinch again on week 8.	After last pinch use Bonzi spray at 10-30 ppm or give a Bonzi soil drench at 3 ppm for longer lasting control.*	Do not over water. These are susceptible to root rot.
Lobelia	8-10	10-12	10-12	10-12	5.5 - 5.8	60-70 Day 55-60 Night	Full Sun	150 - 250 ppm N	Pinch 6" week 2; Pinch larger pots week 4.	After last pinch, use Bonzi spray at 10-30 ppm or give a 3 ppm Bonzi soil drench before last pinch for longer lasting control.*	Heavily wilted Lobelia can burn.
Petunia Calibrachoa Bacopa	9-12	10-12	10-12	10-12	5.5 - 5.8	60-70 Day 55-60 Night	Full Sun	150 - 250 ppm N	Pinch Petunia week 1 and all species on week 4. To get higher quality product, pinch again on larger pots.	After last pinch, use Bonzi spray at 10 ppm. For longer lasting control, use Bonzi sver edge of pot.*	Do not overwater. These are susceptible to root rot. Heavily wilted Bacopa will lose flowers. Recommend preventative treatment for Powdery Mildew.
Petunia Calibrachoa Bidens	9-12	10-12	10-12	10-12	5.5 - 5.8	60-70 Day 55-60 Night	Full Sun	150 - 250 ppm N	Pinch Petunia week 1 and all species on week 4. To get higher quality product, pinch again on larger pots.	After last pinch, use Bonzi spray at 10-30 ppm or give a Bonzi soil drench at 3 ppm for longer lasting control.*	Do not overwater. These are susceptible to root rot. Recommend preventative treatment for Powdery Mildew.
Petunia Calibrachoa Verbena	9-12	10-12	10-12	10-12	5.5 - 5.8	60-70 Day 55-60 Night	Full Sun	150 - 250 ppm N	Pinch Petunia week 1 and all species on week 4. To get higher quality product, pinch again on larger pots.	After last pinch, use Bonzi spray at 10-30 ppm or give a Bonzi soil drench at 3 ppm for longer lasting control.*	Do not overwater. These are susceptible to root rot. Recommend preventative treatment for Powdery Mildew. Deadhead verbena for rebloom.
Petunia Verbena Bacopa	9-12	10-12	10-12	10-12	5.5 - 5.8	60-70 Day 55-60 Night	Full Sun	150 - 250 ppm N	Pinch Petunia week 1 and all species on week 4. To get higher quality product, pinch again on larger pots.	After last pinch, use Bonzi spray at 10 ppm. For longer lasting control, use Bonzi soil drench at 3 ppm once plants are filled out and over edge of pot.*	Do not overwater. These are susceptible to root rot. Heavily wilted Bacopa will lose flowers. Recommend preventative treatment for Powdery Mildew. Deadhead verbena for rebloom.
Petunia Verbena Lobelia	9-12	10-12	10-12	10-12	5.5 - 5.8	60-70 Day 55-60 Night	Full Sun	150 - 250 ppm N	Pinch Petunia week 1 and all species on week 4. To get higher quality product, pinch again on larger pots.	After last pinch, use Bonzi spray at 10-30 ppm or give a Bonzi soil drench at 3 ppm for longer lasting control.*	Do not overwater. These are susceptible to root rot. Recommend preventative treatment for Powdery Mildew. Deadhead verbena for rebloom.
Petunia	6-8	8-10	10-12	10-12	5.5 - 5.8	60-70 Day 55-60 Night	Full Sun	150 - 250 ppm N	Pinch week 1. To get higher quality product give a second pinch.	After last pinch use Bonzi spray at 10-30 ppm or give a Bonzi soil drench at 2 ppm for longer lasting control.*	
Verbena	7-9	12-14	12-14	12-14	5.5 - 5.8	65-75 Day 60-65 Night	Full Sun	150 - 250 ppm N	Pinch all sizes week 2. For higher quality product, pinch 1 - 2 more times on 10" or larger pots.	After last pinch, use Bonzi spray at 10-30 ppm or give a Bonzi soil drench at 3 ppm for longer lasting control.*	Recommend preventative treatment for Powdery Mildew. Deadhead verbena for rebloom.

Uses Guide

Accent & Foliage Plants

Abutilon
Ajuga
Alternanthera
Artemisia
Asparagus (sprengeri)
Coleus
Cordylina
Dichondra
Dracaena (spikes or seed)
Dracaena (cuttings)
Duranta
Dusty Miller
Echeveria
Ferns
German Ivy
Hedera Ivy
Helichrysum Licorice
Herbs (cuttings type)
Heuchera
Ipomea
Iresine
Kalanchoe
Lamium
Lysimachia
Ornamental Corn
Ornamental Grasses
Ornamental Millet
Ornamental Pepper -
Black Pearl
Oxalis
Perilla
Plectranthus
Setcreasea
Sempervivum
Spider Plant (Chlorophytum)
Spilanthes
Sprengeri (Asparagus Fern)
Strobilanthes
Vinca Vines
Wandering Jew

Cut Flower Varieties

Achillea	Iris
Alcea	Leucanthemum
Amaranthus	Liatris
Angelonia (cuttings type)	Limonium
Anthemis	Lisianthus
Aquilegia	Lobelia (perennial type)
Aster	Lunaria
Buddleia	Lupinus
Celosia Century	Lychnis
Centaurea	Monarda
Centranthus	Perovskia
Coreopsis	Phlox (garden type)
Cortaderia Pampas Grass	Physostegia
Cosmos	Poppy
Delphinium	Rudbeckia
Dianthus <i>barbatus</i>	Salvia farinacea
Dianthus <i>plumarius</i>	Scabiosa
Dianthus Supra	Snapdragon Rocket
Digitalis	Tanacetum
Echinacea	Veronica
Echinops	Zinnia State Fair
Erysimum	
Gaillardia	
Geum	
Gypsophila <i>paniculata</i>	
Helenium	
Heliopsis	
Hemerocallis	

Indoor Potted

Abutilon (seed type)	Hypoestes
Calceolaria	Lisianthus
Cineraria	Ornamental Pepper
Coleus Kong	Primula
Cyclamen	Sprengeri
Exacum	Spider Plant (Chlorophytum)
Gerbera	Strobilanthes
Gloxinia	

Hanging Baskets

Anagallis
Bacopa
Begonia - Doubles
Begonia - Dragon Wings
Begonia - Fibrous
Begonia - Solenia
Begonia - Nonstop
Bidens
Brachycombe
Bracteantha
Browallia
Calibrachoa
Chenille (Acalypha)
Coleus
Cuphea
Dahlberg Daisy
Diascia
Dichondra
Dipladenia
Double Impatiens
Evolvulus
Ferns
Foliage Plants
Fuchsia
Gypsophila
Impatiens (all types)
Ivy Geranium
Lantana
Lobelia
Mandevilla
Nasturtium
Nemesia
New Guinea Impatiens
Petchoa
Petunias (all types seed & cuttings)
Purslane
Sanvitalia
Scaevola
Snapdragon (cuttings types)
Torenia
Thunbergia
Verbena - Imagination (seed type)
Verbena - (cuttings type)
Vinca - Mediterranean/Cora Cascade
Viola - Endurio

Premium Annual Pots

Abutilon	Lantana
Accent & Foliage plants	Lisianthus
Ageratum	Lobelia (cuttings type)
Amaranthus	Maracas
Anagallis	Melampodium
Angelonia	Mimulus
Bacopa	Nemesia
Begonia - Doubles	New Guinea Impatiens
Begonia - Dragon Wings	Ornamental Millet
Begonia - Solenia	Osteospermum
Begonia - Tuberous	Pentas
Bidens	Petchoa
Brachycombe	Petunia - Spreading
Bracteantha	Petunia - Vegetative
Browallia	Phlox - 21st Century
Calibrachoa	Primula
Canna	Purslane
Chenille (Acalypha)	Ranunculus
Coleus - Kong for shade	Salpiglossis
Coleus - Sun type (cuttings)	Salvia (annual cuttings)
Cuphea	Sanvitalia
Dahlia - (cuttings type)	Scaevola
Daisy Marguerite	Seed Geraniums
Dahlberg Daisy	Snapdragon (cuttings type)
Diascia	Talium
Double Impatiens	Tithonia
Evolvulus	Torenia
Fuchsia - pot types	Thunbergia
Gazania	Verbena (cuttings type)
Geraniums	Vinca - Titan, Cora
Gerbera	Viola (cuttings type)
Gypsophila (cuttings)	Zinnia (Zowie, Swizzle & Solcito)
Heliotrope	Zonal Geraniums
Herbs (especially cuttings types)	
Hibiscus - Luna	
Impatiens - Semi Double	
Impatiens - Doubles (cuttings)	
Ivy Geranium	

Perennials

that are useful as Premium Annuals.

Bellis Galaxy	Helenium - Dakota Gold
Coreopsis (Heliot, Early Sunrise, Rising Sun)	Heuchera - especially good for combination planters.
Dianthus <i>barbatus</i> (Amazon & Dynasty Double)	Hibiscus - Luna
Euphorbia	Polemonium
Gaillardia - Arizona Sun	Rudbeckia (Becky & Toto)
Gaura	