

# **Josephine County Master Gardener Association**

## **Greenhouse Information & Handout**

JOCO MG  
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# Master Gardener Greenhouses

## **Overview:**

The MG greenhouses are located directly behind the Extension Service Auditorium. There are 3 structures; a heated greenhouse (the large greenhouse); a seed germination greenhouse (the little greenhouse); and an unheated coldframe.

## **Objective:**

*The main objective of the greenhouse operation is to have fun, to learn, and to put to use some of the knowledge provided in the Master Gardener classroom.*

A daily greenhouse team composed of members from the current class and one or more senior master gardeners (team leaders) operate the greenhouses. This allows you to put into practice many of the things learned during the class. The plants grown in the greenhouse are sold by the Master Gardeners at the Spring Garden Fair held in April. The money made from the sale of these plants is used to offset the cost of the greenhouse operation and help pay for other master gardener projects. The Spring Garden Fair is the main fundraiser for our Master Gardener Chapter.

## **Hours:**

The greenhouse operation will begin on Monday, January 18<sup>th</sup>. Greenhouse classes typically run from 9 to 11am each day except Thursday during the class training weeks. Once classes are completed, students will be asked to volunteer to help on Thursday until our plant sale in April. Students will start each day in the middle Greenhouse with a review of progress over the past week, noting any problems that we are experiencing and determining what needs to be done for the day. Early in the season, (January-February) we may finish before 11am. Later on, (March-April) we may run beyond 11am. As the volume of plants needing care increases. The hours you work in the greenhouse count as part of your payback hours.

## **Signups:**

Our goal is to have everyone in the class participate in the greenhouse work. However, we must limit participation to a maximum of 9 students per session. A signup sheet for greenhouse work will be circulated during the first day of class. Please consider which day works best for you and sign up for that day as your first choice and be sure to pick an alternate day as your second choice. Should there be more than 9 students choosing the same day, excess students will be given their alternate choice. Historically, some people like to spend more than one day a week in the greenhouse. After everyone has had an opportunity to sign-up, we will consider allow students to signup for additional days.

## **Questions:**

If you have questions please don't hesitate to ask the greenhouse team leaders, your class mentors, or any one of the senior master gardeners. We are all there to assist you.

## **Greenhouse History and Operation**

Master Gardener volunteers constructed the greenhouses. All the materials were either purchased by the Master Gardeners, or donated. The property on which the greenhouses are located belongs to Josephine County.

The largest greenhouse was built in 1998. It is a metal tube frame covered with two layers of ultraviolet resistant greenhouse plastic. Air is blown between the two layers of plastic to create an insulation layer. The greenhouse is heated by baseboard heaters and cooled by a large ventilation fan. A thermostat located on the back wall is set to turn the heaters on when the temperature in the greenhouse falls below a certain level. Please do not change the temperature setting unless instructed to do so by a team lead. In a similar manner, a second thermostat turns on the ventilation fan if the greenhouse becomes too hot. The fan vents hot air out the back of the greenhouse while vents on the front of the greenhouse allow cooler outside air to be pulled into the greenhouse. Venting allows us to keep the temperature down during warm spring days. Additional fans inside the greenhouse constantly circulate the air to keep down humidity and encourage strong plant growth. The large greenhouse requires the plastic to be replaced periodically, most recently in 2013.

The smaller greenhouse was purchased and erected in 2007. Manufactured by Solexx, its frame is a mixture of composite and PVC piping, covered with a twin-wall polyethylene panels. Space heaters are used to heat the small greenhouse, and a fan setup similar to the large greenhouse is used to cool it. Heat mats are used to keep a more even temperature on the bottom of the seed trays. In general, the small greenhouse is kept slightly warmer than the larger one, to encourage rapid seed germination.

The cold frame greenhouse on the left was relocated in the winter of 2001. It has a metal frame and it was previously a glass greenhouse at the Jackson County Extension. After relocation, the glass was replaced with a single layer of hard greenhouse fiberglass. In 2009, the fiberglass covering was replaced with polyethylene Solexx and a small heater was added. It is used to over-winter perennials, grow annuals that tolerate cooler temperatures but need protection from wind, rain and/or snow. This greenhouse also functions as a plant overflow area for a few weeks before the Spring Garden Fair.

A hot water heater services all three greenhouses and allows us to water plant starts with warm water and to wash pots at the pot washing station behind the center greenhouse with warm water, as well.

## **Perennials, Trees, & Shrubs Program**

### History:

Until 2010 our greenhouse efforts focused primarily on growing annuals and a limited number of perennials and donated trees. All were sold or moved off-site each year in May, and the greenhouse operation was closed for the year.

Starting in 2010, we expanded the greenhouse operation to a year round program. This expansion gave us the ability to maintain the unsold annuals during the summer and to begin to grow an inventory of perennials, trees, and shrubs in a true nursery sense. To assist in this endeavor, you will notice a variety of outdoor shelving units, and watering systems designed to keep these plants happy during the summer months located between and behind the greenhouses.

### Goals:

Our goals were to expand our educational offerings for growing and propagating, as well as to provide knowledge and experience in identifying and caring for various types of perennials, trees, and shrubs. This experience has been offered to both senior and student Master Gardeners through hands-on workshops and work parties. It has also provided a wider variety of plant offerings to the public at our Spring Garden Fairs, and other sales events during the year.

With this in mind, we established a perennial program designed to maintain the plants year round and to source plants from four main areas:

- Individually donated plants
- Grower donated plants and trees
- Committee purchased plants (Plugs and starts)
- Master Gardener propagated plants

During this year's greenhouse sessions we will be offering short hands-on training sessions covering various popular methods of propagating perennials; such as, from stem cuttings, leaf cuttings, layering, and simple division. These sessions will supplement the greenhouse training during the early weeks when there is available time.

In addition to the 6 days of the week greenhouse sessions, Tuesday mornings from 9-11 AM have been designated as perennial workdays. Initially these sessions run concurrently with the greenhouse operation but they continue through the summer and fall after the greenhouse program has ended for the year. Students are encouraged to become involved in this area after the Spring Garden Sale in April. During this period, which typically extends into November, we offer various propagation classes monthly, focusing on specific propagation techniques as a part of our process to expand both our knowledge and our inventory. We also pot and label donated and other propagated plants and we generally provide care and nurturing for these nursery plants. The coldframe greenhouse is used to house starts and weather sensitive plants until the weather permits them to be placed outside.

You will have the opportunity to volunteer your time; initially in the seeding and growing of annuals and some perennials, and as the season progresses, in the propagation and care of various perennials, trees, and shrubs.

## Things to do when working in the Greenhouse:

- Check with team leader to determine what needs to be seeded, transplanted, watered, etc.
- Tour the greenhouses each day, check how things are growing, look for any problems and bring them to the attention of team leaders.
- If unsure about anything, ask questions.
- Keep the greenhouses clean, wash trays and pots after emptying. Don't leave a mess for the next day.
- Refill soil barrels if they can hold another bag of soil.
- Track your hours on volunteer log sheet for your reference and report your hours on the VRS System.

### Watering duties in the Little Greenhouse:

- Remove all domes on seed trays.
- Water all seed trays thoroughly and **gently** with warm water. Do not dislodge the seeds when watering.
- Recover the trays that have absolutely no signs of germination.
- Visually inspect each tray and cells for signs of growth.
- Advise team leader of any trays that are ready to be relocated or transplanted.
- Notify team leader of any concerns or problems.
- Check that trays are fully on the heat mats.
- When watering, ensure that the heat mat temperature probe is firmly in a 4-inch pot, on the mat, and that the soil is wet.

### Watering duties in the Big Greenhouse:

- Check pots and cells with a moisture meter.
- Make sure the plants are neither too wet nor too dry.
- Water using a small water bottle or a watering hose, as needed.
- Inspect plants for problems when watering.
- Notify team leader of any concerns or problems.

### Duties in the Coldframe:

- Check plants with a moisture meter.
- Make sure plants aren't too wet or too dry.
- Notify team leader of any problems.

# **Greenhouse Controls**

## **Greenhouse Thermometers**

The greenhouse thermometers are designed to read and record both the high and low temperatures since they were last reset. The range on the left side is used to read the low temperature (note that the range is reversed) while the range on the right side is used to read the high temperature. As you look at the ranges you will notice the normal mercury (silver) bar, but also you will see a small blue bar about an inch long just above the silver bar. At the bottom of each blue bar you will see an enlarged area or dot. These blue dots are used to determine the high/low temperatures. Look at the high temperature side, compare the upper most tip of the silver bar to the range, this gives you the current temperature. Now look for the blue bar and the dot at the bottom. Compare this to the numbered range; this gives you the highest temperature in the greenhouse since the last time the thermometer was reset. The left or low temperature range is read in the same fashion except that the range is reversed. Find the blue bar and the dot, compare the dots position to the range (keeping in mind the reversed numbering); this gives you the lowest temperature in the greenhouse since the last time the thermometer was reset. Reset the blue bars by using a magnet to pull the blue bar down until it touches the silver bar. We typically reset the thermometers each morning after recording the high / low temperature in the seed log book.

## **Large Greenhouse Thermostats**

The Large greenhouse has 2 thermostatic controls located on the back wall; the left one controls the large fan, and is normally set at 75 degrees. This control is used to 'air' the greenhouse each morning. To do this simply rotate the control to the left until the fan comes on, and allow it to run for approximately one minute, then reset the dial to 75 degrees. Anytime the temperature rises above 75, the fan will automatically come on and draw cooler 'outside' air into the greenhouse.

The thermostat on the right is used to control the baseboard heaters located on the left and right sides of the greenhouse. We try to maintain the daytime temperature at approximately 60 –65 degrees, and no adjustment should be needed.

## **Small Greenhouse Thermostats**

One or two electric, oil-filled, heaters heat the small greenhouse. These, coupled with the heated grow mats, are capable of warming the greenhouse to 70+ degrees. A thermostat located on the right side of the back wall provides control for the heaters; it should be set to 70 degrees. The heat mat thermostats should also be set to 70 degrees. If adjustment seems needed please bring this to the attention of your team leader.

The cooling fan thermostat is also located on the back wall, just below and to the left of the fan; it should be set for 85-90 degrees. This control is also used to 'air' the greenhouse each morning. To do this simply rotate the control to the left until the fan comes on, and allow it to run for approximately one minute, then reset the dial to 85-90 degrees.

## SOILLESS GROWING MEDIA

Soilless mixes contain no garden soil. They are light, easy to use, have a consistent, durable structure, and they are relatively free of pests and diseases.

Garden soil is not a good sowing or growing medium for plants in containers. It is prone to compaction, thus depriving the roots of oxygen and impeding good drainage. It is also likely to contain pests and diseases.

**Seeding Mix** is a sterile, fine-textured medium that is moisture-retentive and has no nutrients. The texture of the small particles allows for contact between the small seeds and the moist seeding mix, which aids in germination.

**Transplanting Mix (Greenhouse Mix)** provides good drainage and air movement. It is free of pests, diseases, and weeds. It also contains nutrients to aid in the plant's growth.

Although we purchase our mixes ready made, when mixing your own we recommend:

**Seedling Mix Formula:** 50% peat moss, 50% vermiculite, a wetting agent and trace elements.

**Transplant Mix Formula:** 45% mulch, 25% peat moss, 20% pumice, 5% vermiculite, 5% perlite, a wetting agent, fertilizer and trace elements.

Other soil mixes may be made with peat substitutes such as coir fiber derived from coconut husks. Coir dries out less quickly than peat, however, plants grown in coir fiber require more feeding. Coir is more sustainable than peat. Peat bogs are being depleted at an alarming rate so coir is considered to be a better alternative.

**Perlite** is heat expanded rock granules. Sterile, inert, and light, it aerates the soil, providing good drainage, but it does not hold nor supply nutrients. It is the white, gritty, rock-like material we use.

**Vermiculite** is heat expanded and air-blown mica. It acts similarly to perlite but holds more water and less air. It will hold and supply added nutrients. It allows light to penetrate, so it is a good cover for small seeds that need light to germinate. It is the golden colored, soft material we use.

**Grit/sand/pumice** is used to improve drainage. Typically sand is used as a growing medium in some bulb pots.

**Water-retentive gel** is commonly used in container soil mixes to conserve water. The dry crystals absorb water, increasing in volume to form a granular jelly. We will be adding this to our hanging baskets to help retain moisture. Some cuttings can be rooted in the gel by adding liquid fertilizer to the crystals then inserting woody cuttings into the gel.

Source:

Plant Propagation American Horticultural Society book edited by Alan Toogood

## SOWING SEEDS

We use seeding mix when sowing seeds that will eventually be transplanted into larger containers. The mix is much easier to work with when it's damp. Put a small amount of seedling mix (enough to fill a seed tray) into a bucket. Add a small amount of water and "knead" the mixture. It should be damp, but not soaking.

Fill the entire seed plug tray with seedling mix. Shake or tap the soil to settle it and refill with soil. **Each cell should have about ¼" space left at the top.** Overfilling the cells may result in the seeds being dislodged when watering. Very, slightly firm the soil in the cells. **DO NOT** return the damp unused mix to the seedling mix barrel. Leave the damp soil for use by the next class. Mark the bucket accordingly (i.e. "damp seedling mix").

The time to sow our seeds is based on the Harris Seeds Cultural guide. A copy of the schedule is in your folder. The seed schedule reflects planting from the "date of anticipated sale" for various sizes of maturity (sold as four or six packs, 4" pots, or gallon size). Review cultural requirements on the seed packets and the Harris Chart. It is important to know light or dark requirements for germination and the depth to plant the seed.

In the folder on the desk, you will find the seed packet(s) to be sown for each day along with a log showing what was done. Before starting to sow the seeds, remove any excess soil from the work area and return it to the "damp seedling mix bucket". Next, carefully cut open the bottom of the packet to preserve the photograph, if there is one. The photo and information may be needed for the plant sale. Handle all seeds carefully. Some seeds are as fine as dust and some are extremely brittle. Usually we seed one seed per cell (alyssum and lobelia are some of the exceptions). Each seed tray holds 72 seeds. Ask the team leader for directions on specific seeds.

Tips for sowing seeds:

- Don't sneeze.
- Don't stand in front of a fan.
- Gently firm the soil in each cell before placing the seeds. This will ensure the small seeds do not fall too deep between the particles of soil.
- Try putting a little seed in your hand or on a piece of paper or a shallow cup. Then use tweezers to pick up and drop the seed into the cells. Or, try using a plant label to scoot seeds into the cells of the tray.
- Experiment to see what technique works for you.

Check the chart to see if the seeds need light or dark conditions when germinating. If they need dark conditions, sprinkle some seedling mix over the top after seeding. If they need light to germinate, sprinkle a thin layer of fine vermiculite over the top.

Vermiculite allows light to reach small seeds. If the seed guide doesn't specify, then treat the seed as dark and use some seedling mix to cover them.

After covering the seeds very gently firm the soil in each cell. This should not compact the cell but just help settle the covering.

# SOWING SEEDS

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Be sure to label every seed tray. **Labels are very important!** Two labels are needed for each 72-cell seed tray. Use a pencil or a **Permanent ink** black pen to write the information below on two white labels.

At a minimum each label should contain the following:

- Name of the plant – example -Tomato
- Variety of the plant – example - Early Girl
- Date of sowing – example - 3/31
- Number of days till expected germination (not needed for transplant labels)
- Size of pot at sale i.e. 4-pack, 4-inch pot, or 1-gallon pot

We put 2 labels (for each variety of seed) in each seed tray. We use 2 labels in case one is lost or dropped during watering or transplanting. A seed tray without labels makes for a good guessing game, but in the end frequently ends up in the compost pile.

When the seedlings are transplanted, one label is needed for each plant container. Here again, one label for each 4-pack, 4-inch pot, or 1-gallon pot. In the case of direct seeding, where the seeds are sown directly into the container in which they will be sold, place one label in each container.

Water the tray thoroughly, but gently, using warm water. Using a water bottle seems to work best for the initial watering. Since you started with moist seedling mixture this may not take a large amount of water. Be careful not to wash the seeds from the tray. Make sure the entire plug gets wet by checking underneath the tray to see that it is draining water. The water should be apparent, but not running out of the drain holes.

If there is any excess seedling mix in the drain tray, remove it but **DO NOT** return it to the “damp seedling mix” bucket. Since there may be some seeds mixed in, discard this excess mix into the compost area.

Place the labels (one on either end) of the tray, cover the tray with a plastic dome, and move the tray to the little greenhouse. Most seed trays should be placed on a heat mat (a few seeds require a colder germination). If there is no room on the heat mats, check with the team leader.

Update the planting logs and note in the daily logs what was seeded.

# TRANSPLANTING

Each day all seed germination trays in the little greenhouse should be checked. As soon as one or more seeds germinate the plastic dome should be removed. Once the seedlings have developed two “true leaves” and are large enough to handle, they can be transplanted.

At the beginning of each day check with your team leader to see which seedlings are ready to be transplanted. Later in the season, we may also transplant smaller containers 4-inch to larger 1-gallon. The process for all transplanting is the same.

Check planting log or the tray label to determine what size container is needed for transplanting. Prepare the Transplant Mix by adding slow-release pelleted fertilizer to the mixture. The easiest way, is to gradually fill a 5 gallon bucket with soil while adding a measure of the fertilizer, at a rate of one measure per gallon of soil mix, or 5 measures per bucket. Be sure to mix in the fertilizer as you add it. When ready to use, you should be able to see a few of the pellets in the mix. Next, prepare the proper size **clean** containers with transplanting mix. Remember to shake or tap the pot to settle the soil, then add more, filling to about 1/2” below the lip of the pot.

Make a hole in the center of the container approximately the same size as the root ball from the 72-cell tray.

Use a tool, such as a section of mini blind, blunt knife, spoon or similar object, carefully scoop under the seedling. Gently lift the entire root ball, keeping as much soil as possible attached to the root. Sometimes moistening the soil a few minutes prior to this process will help to hold the ball together. **Do not** pull on the seedling as this may crush the fragile stem or even tear it away from the root.

Set the seedling in the center of the hole. Gently firm the soil around the seedling. VERY lightly pat the soil to help hold the plant upright. If you firm the soil too much, it may restrict oxygen to the roots. If you don't pat the soil, the plant may fall over and large air pockets may make it hard for roots to reach nutrients. Next, water around the plant with warm water while trying not to get water on the plant leaves.

## **The Exception:**

Some plants (specifically tomatoes) need to be “buried” when they are transplanted. The deeper the seedling is transplanted the better root structure it will develop. Make sure and check with your team leader before transplanting your first tomatoes.

# TRANSPLANTING

(Continued)

## Tip:

If the seedling has exceptionally long roots, do not cram the roots in the pot. Instead, lean the pot on its side, remove a little soil, position the plant in the pot so that the roots appear spread out on the growing medium, and gradually fill in with soil as you tilt the pot back to its upright position. Instead of the roots being coiled and possibly root-bound, this method will allow more root surface contact with soil and provide for vigorous growth.

## Be sure to label every container.

**Labels are very important!** A file of pre-printed labels can be found on the workbench. The labels sheets are filed alphabetically using the common plant name. If pre-printed labels are available for the **EXACT** variety of plant, place one on each stake. Use only the number required and return the unused labels to the file. If pre-printed labels are not available, hand write the information on each plant stake. Use a pencil or permanent marker and a white stake for annuals or a yellow stake for perennials.

At a minimum each label should contain the following:

- Name of the plant – example -Tomato
- Variety of the plant – example - Early Girl
- Size of pot at sale i.e. 4-pack, 4-inch pot, or 1-gallon pot

***Place a label in each container facing the same direction in the same position at the back right hand corner of the container.*** Later in the season, as the greenhouse fills up, being able to see each plant label without moving the flats is extremely helpful. Also, having the labels in the same place facilitates the watering process. Place containers in a drainage flat and find room in big greenhouse.

As the season progresses please make an effort to keep the same or similar flats of plants near each other. This will simplify our movement of all the plants to the Spring Garden Fair.

If no clean containers are available then prepare them as follows:

- Locate needed (dirty) containers
- Knock out any loose soil an/or roots
- Fill one sink with water and soap solution
- Fill the other sink with bleach solution (about 1 or 2 “glugs” in ½ full sink)
- Wash containers in soap and water and rinse in a mild 5-10% bleach to water solution
- Leave to air dry on the racks or move them to the greenhouse for immediate use.

Tip: Using warm water makes this a much more enjoyable task on a cold winter day.

## WATERING CONTAINER PLANTS

Watering properly is possibly the most difficult single task to master in gardening. Watering requires an understanding of the fundamental principles of gardening including plant growth and plant requirements. Good judgment, skill, and patience.

For our greenhouse operation, a moisture meter will be used on all containers larger than the seed plugs. Instructions on how to use the moisture meter are provided, however, the basics of watering are explained first.

How to water effectively cannot be satisfactorily explained in mere words, but the principal rules can be stated, as follows:

- Water while the soil is still fairly (barely) moist, BEFORE the soil reaches the stage of being completely dry and/or powdery.
- Avoid keeping the soil continuously wet. It is not necessary to drench the container.
- Avoid light surface sprinkling of containers. Such applications of water are actually worse for the plant because it encourages the roots to develop near the surface of the soil, where the moisture is applied.
- The quantity and character of soil composition directly influences water applications.
- Do not get water on the foliage - this encourages botrytis, a deadly fungus that can easily kill all the plants in the greenhouse.
- If possible greenhouse plants should be watered in the morning so that excess water has successfully been used or ventilated off of the plants before night.

In mild to warm winter weather, too much water in the greenhouse environment can be highly detrimental (such as hosing off the floor). The humidity builds up and is not released when the temperature outside is close to the temperature inside.

Watering can be safely done in the afternoon hours later in the season when the temperature is higher and the air relatively dry, remembering to provide adequate ventilation.

The water temperature should be no less than ten degrees lower than the air temperature.

## WATERING SEED PLUG TRAYS

Seed plug trays are to be kept wet at all times. The trays are specifically designed to drain freely and not sit in any run-off water. Be sure the underliner tray has drain holes that will allow the water to drain out. The seed mix dries out quickly, due to the nature of the "soil less" mix. Seeds need constant moisture to germinate. If seeds completely dry out during any stage prior to the true leaf appearing, the seedling will most likely die or be more susceptible to disease. When possible use the misting wands to water, making sure the water temperature is correct (warm). Be certain the flow of water is not so fast as to knock down any seedling, or float away any small seeds.

## USING THE MOISTURE METER

The Humidity/Moisture meter is a device that measures the moisture content of a container. The meter has a metal probe. The moisture meter is used on all containers with the exception of the plug trays. Watering in the greenhouse is time consuming and must be done with great care to be successful. It requires patience and close attention to detail.

- Obtain the meter.
- Insert the probe into the container at the halfway point between the plant and the edge of the container.
- Watch the meter as you insert it. Often the surface area will read dry, the root zone (which is about half way down) will read differently, and the very bottom of the container may have yet another reading.
- Remove the moisture meter and **wipe off** the metal probe before moving to the next container.
- From your observation, determine if the container needs water.

If water is needed:

- Apply the water so that you do not get foliage wet. This effectively eliminates spraying the plant overhead with the wand.
- Use the wand if you can control the spray to apply the correct amount of water, while keeping the foliage safe and dry. Otherwise, use the various drinking bottles, or watering cans provided.
- Water the plant correctly before you move on to the next plant.
- Apply enough water to get the root zone moist, but not into the wet zone.
- Do not completely drench the container.
- **The moisture meter probe must be wiped clean before inserting it into another container.** If you skip this step, the excess moisture, and soil on the meter will give you a false reading and therefore make your watering inaccurate.

Watering properly using only one meter takes from 1 to 2 hours and can take up to 4 hours late in the season. Several people each using a meter will cut this time down. Please use care and examine every single plant you water.

Prepare for this to be a long process - split up this duty, if needed, during your shift. This should also be a rewarding experience as you watch the changes occur each week to your little seedlings.

The most common problem we have in the greenhouse is **TOO MUCH WATER!** Remember we have a class every day checking and watering. If a plant almost needs water – leave it for tomorrow.

Make sure your greenhouse manager or team leader demonstrates these steps for you and have fun growing.

## Prevention of Problems

- Keep the greenhouse clean.
- Clean up after use.
- Sterilize pots, flats, seed plug cell trays, and any other containers by dipping in a 5 -10 percent bleach to water solution after spraying out loose dirt.
- Use clean hands and tools.
- Use sterile soil and soil less mixes.
- Monitor and inspecting plants regularly.
- Use yellow sticky traps.
- Keep greenhouse a little cooler to prevent fungal diseases.
- Remove dead or damaged plants.
- Water carefully around the plant. Avoid getting the leaves wet.

"A temperate greenhouse has minimum daytime temperatures of 50-55 degrees F (10-13 C) and nighttime minimum of 45 degrees F (7 C). Additional warmth may be needed for propagation in spring.

55-65 degrees F daytime is a warm greenhouse and with high humidity can grow tropical and subtropical plants.

Reference: American Horticultural Society, Plant Propagation Book edited by Alan Toogood. Find this book in the Master Gardener Plant Clinic or the County Library, book # 635.043

## One Disease to Watch Out For:

### Damping-Off

Symptoms: the stem of a young seedling develops a dark rot right at the soil line. The seedling topples over. The rest of the plant usually appears healthy. Seeds can also rot before they sprout.

"Damping-off" is a blanket term for a disease that can actually be caused by any one or a combination of a number of fungi. The culprit may be *Botrytis*, *Rhizoctonia*, *Pythium*, or *Phytophthora*.

Fungi and spores drift in the air, hide in soil, float on water, and sit on the surface of seeds and plants. They are there and ready for the right conditions in which to flourish. They thrive in dampness, warmth and stagnant air. Damping-off spreads rapidly.

Prevention is the key. It is the only treatment for the disease.

Ways to prevent damping-off:

- Use only sterile planting media.
- Use sterile trays and pots by spraying them clean and dipping them in a ten percent bleach solution.
- Keep hands, tools and work area clean.
- The master gardeners choose to keep the greenhouse a little cooler than some commercial growers in order to deter fungus diseases.
- Remove domes from seed trays as soon as any germination occurs. This helps to lower humidity around the new starts.
- It is also recommended to soak some seeds in a fungicidal drench before planting.

From: Foolproof Planting by the editors of Rodale Press 1990 Roundtable Press, Inc. County Library 635 Halpin, A. M. Pages: 51-52

## HANGING BASKETS

Summer is the time for gorgeous hanging baskets. Here are some tips on creating a beautiful display:

Aim to hide the basket. Plant both the top of the basket and through the sides. The gaps in the wire baskets we have this year, allow young plants to be inserted on the sides. The coir fiber liner must be slit. Be sure to bed the roots well into the soil mix in the basket.

A useful formula is to plant trailing and lax plants on the sides and at the rim.

A few short and stocky upright plants can be used in the crown. Plants of lax growth are natural for hanging baskets. Low and spreading plants are good at the top edge of the basket. These plants include impatiens, pansies, fuchsias and others of stiff trailing growth. To mask the basket itself, pliant plants such as lobelia, cascading petunias, trailing alyssum, ivy and helichrysum work well. Then on the top of the basket plant more upright or clump-forming plants such as zonal geraniums, impatiens, dusty miller or pansies in any combination that is pleasing.

Think about the color of the flowers and foliage, their growth habits, and shape of the plants. It is also important to think of the needs of the plants: which ones like partial shade or full sun, for example. Plants with similar needs can be grouped together in one basket and placed in the appropriate spot around the home.

The best plants for shade are impatiens, ferns and variegated ivies. Most flowering plants suitable for hanging baskets will thrive in full sun or partial shade.

Plants we are growing in the greenhouse that may be fun to try in a hanging basket:  
(Use your imagination; these are only suggestions to help as guides)

Upright plants are good for the top:

- Geraniums
- Dwarf Nicotianas
- Dusty Miller
- Sage
- Coleus

Trailing plants good for sides:

- Lobelia
- Petunia
- Nasturtium
- Helichrysum
- Vinca

Stiff trailing plants, good for around top edge:

- Pansies
- Impatiens

Herbs can be used too:

- Parsley, Thyme, Rosemary

# HANGING BASKETS

(Continued)

## MATERIALS NEEDED TO PLANT A BASKET

Bucket to soak the coir fiber liner  
Coir fiber liner  
Wire basket and hanger  
Transplant mix  
Slow-release fertilizer  
Water-retaining granules  
Small plastic sheet or tray  
Young, healthy plants  
Bucket or large flowerpot  
Scissors or craft knife

## Steps to planting a basket

1. Soak coir fiber liner in a bucket of water to ease molding it into the wire basket.
2. Place the basket on a bucket or large flowerpot to stabilize it while working on it.
3. Press the coir fiber liner firmly against the bottom and sides of the wire basket. Be gentle, as the water soaked fiber is fragile.
4. Trim off any liner that extends above the rim of the basket.
5. Make slits about 2 inches long in the side of the liner for planting in tiers. Make one or two tiers in the side of the basket. Trailing plants inserted here will mask the basket.
6. Mix the soil mix, slow-release fertilizer and water-retaining granules.
7. Add the small plastic sheet or tray (no taller than  $\frac{1}{2}$  to  $\frac{3}{4}$ 's of an inch) to the bottom of the Coir liner. This assists in water retention.
8. Add prepared soil mix to the basket, filling the bottom to the level of the first tier of slits cut in the side of the liner. Shake basket a little to settle the mix.
9. Wrap the foliage of each trailing plant in a small sheet of plastic to form a cone over the stem and leaves. This will protect them as they are inserted through the liner.
10. Working from the inside, insert each plant through the slits carefully. When the plant is in position with the root ball inside of the liner and the leaves and stems outside, unwrap and remove the plastic.

## HANGING BASKETS

(Continued)

11. In the same way, finish planting the bottom tier. Add remainder of prepared soil mix. Work the soil around the roots and fill to the next tier of slits if you have made two tiers. Otherwise fill to within 2 inches of the rim.

12. Plant the second tier in the same manner as the first. Fill with soil to within 2 inches of the rim. (Skip this step if you only have one tier)

13. Around the edge of the rim, plant lax plants such as fuchsias, petunias, pansies, etc.

14. Add more soil mix, work it around the roots and gently press the soil.

15. In the center of the top, plant more upright plants such as dusty miller, zonal geraniums, etc.

16. Fill with soil mix to about 1 inch below the rim of the basket.

16. Water thoroughly.

### A FINAL NOTE ON SUSTAINABILITY:

There are many types of liners for hanging baskets. It is still common to see sphagnum moss liners, however the use of substitutes is highly recommended.

Coir fiber is another option for hanging basket liners. It is more sustainable, coming from coconut fiber. It is natural looking, however it is harder to cut and shape into the basket. We have coir fiber for our baskets this year. They cost the same as the sphagnum moss liners in terms of money and are more in line with our goal of becoming more sustainable in our actions. Soaking the liners before inserting into the baskets will help mold them more easily.

Soil-less mixtures are best for hanging baskets, as they are lighter and easy to handle. Many, like ours, are based on peat. Soil-less mixtures based on peat substitutes, which are more sustainable, are available. Some of these also use coir fiber.

### SOURCE:

Hanging Baskets American Horticultural Society Practical Guides by David Joyce County library 635.986 Joyce, D