CARING FOR YOUR ROSES

PLANT HYDRATION/SWEATING BAREROOT ROSES

- Rehydrating roses by watering before potting is a key to success.
- If possible, sweat bareroot roses. Sweating gets the rose off to a good start.
- Do not sweat roses going into a cold environment (less than 56 °F daytime temperature).
- Sweat bareroot roses in the plastic lined carton.
- Spray plain water on the bareroot roses in the carton.
- Close the plastic liner and close the box.
- Store the closed carton at 60°-70°F.
- Do not store in sunlight.
- Wait to plant until eyes have grown to 1/8" to 1/4" long (five to seven days).
- Do not delay planting when eyes have reached 1/4". Further growth without light will stretch roses and compromise plant growth.

SWEATING POTTED ROSES THAT WON'T BREAK

- If potted roses do not break within two weeks of planting, notify the container rose group immediately.

- ***Multiple plants***
  ⇒ Water with plain water
  ⇒ Cover with a 1 or 2 mil plastic tarp or sheeting
  ⇒ Check daily for bud break. Remove plastic as soon as eyes have grown to 1/8".

- ***Single plants that will not break***
  ⇒ Water with plain water
  ⇒ Cover with a plastic bag
  ⇒ Check daily for bud break. Remove plastic bag as soon as eyes have grown to 1/8".

SOIL MIX

- Use a well-drained, high organic matter content, sterilized potting soil.
- Ideal soil mix has 30% pore space to provide enough oxygen to the developing roots to allow good water percolation and nutrient absorption.
- Soil mix should not be too heavy to avoid pot drainage and shipping problems.
- Soil mix must be stored on a concrete pad or on some form of barrier to prevent disease and pest contamination.
- Correct pH to 5.8 – 6.5 with limestone or dolomite. Roses prefer a slightly acidic growing medium.
- Sample container pH and Electrical Conductivity (salt content levels weekly during the season using a pH meter and an EC (Electrical Conductivity Meter). The water leachate (water taken one hour after regular irrigation by pouring distilled water into the container and capturing runoff as it leaves the bottom of the container) below 3 deci-Siemens/Meter during the growing season and below an EC of 2 deci-Siemens/Meter at the time of shipment.

  Method Reference: NC State Horticulture Information Leaflet 401. May be found on line at:

  http://www.ces.ncsu.edu/depts/hort/hil/hil-401.html

  (EC = Electrical conductivity of the saturation extract of the soil [dS m^{-1}].

Each grower has different climate and local conditions that determine choice of soil mix.

Suggested soil mixes:

Heavy mix: 2 part sterilized soil, 1 part peat moss, 1 part sand

Medium mix: 1 part well aged composted bark, 1 part sand and limestone as needed to adjust pH.

Light mix: 1 part well aged composted bark, 1 part peat moss, and sand if needed for additional weight.

NOTE: Sand is helpful to keep plants, especially trees upright at garden centers. Do not layer sand at the bottom of the container, mix it in the media.

PRUNING AND POTTING

FOLLOW IN SEQUENCE:

- **Soak** roots in clear water overnight. (Sweating in the boxes may eliminate the requirement for this step). Regardless, keep the roots wet at all times.

- **Cane Pruning.**

    1. Prune canes to 4" to 6" (minis OK to 3 inches). This is critical for plant performance!

    2. Use sharp, clean blades to prune rose canes to avoid introduction of disease and pests. Clean blades frequently using alcohol wipe.

    3. Remove any shriveled, small, or dead canes.

    4. Refer to the illustration (page 9) for the best place on each cane to prune.

- **Root Pruning.**

    1. All Roots should be pruned to not less than 6-8 inches if needed to eliminate curling around in the pot and perhaps lapping back up the sides.

    2. Very large hard, thick and or "J" roots may be cut back as required to accommodate potting.

- **Potting**

    1. Plant to maintain the original soil line immediately below the bud union on grafted roses (some media contact with the bud union is OK). Own-root roses should be planted one inch below the crown or directly below where shoots emerge.

    2. Plants must be centered in the pots to within ½ inch of true center.

    3. Tree roses and climbers require stakes. Tree roses must be grown so that the trunk is vertical. Climbers need staking to keep them manageable and appealing. Grower should use discretion in type and diameter of stake used.

NEVER LET THE ROOTS DRY OUT!

- ❖ Keep roots wet with a sprinkler while staging for potting. If plants must be left without misting or sprinkling such as for breaks, lunches and/or overnight, please cover with several layers of wet burlap.

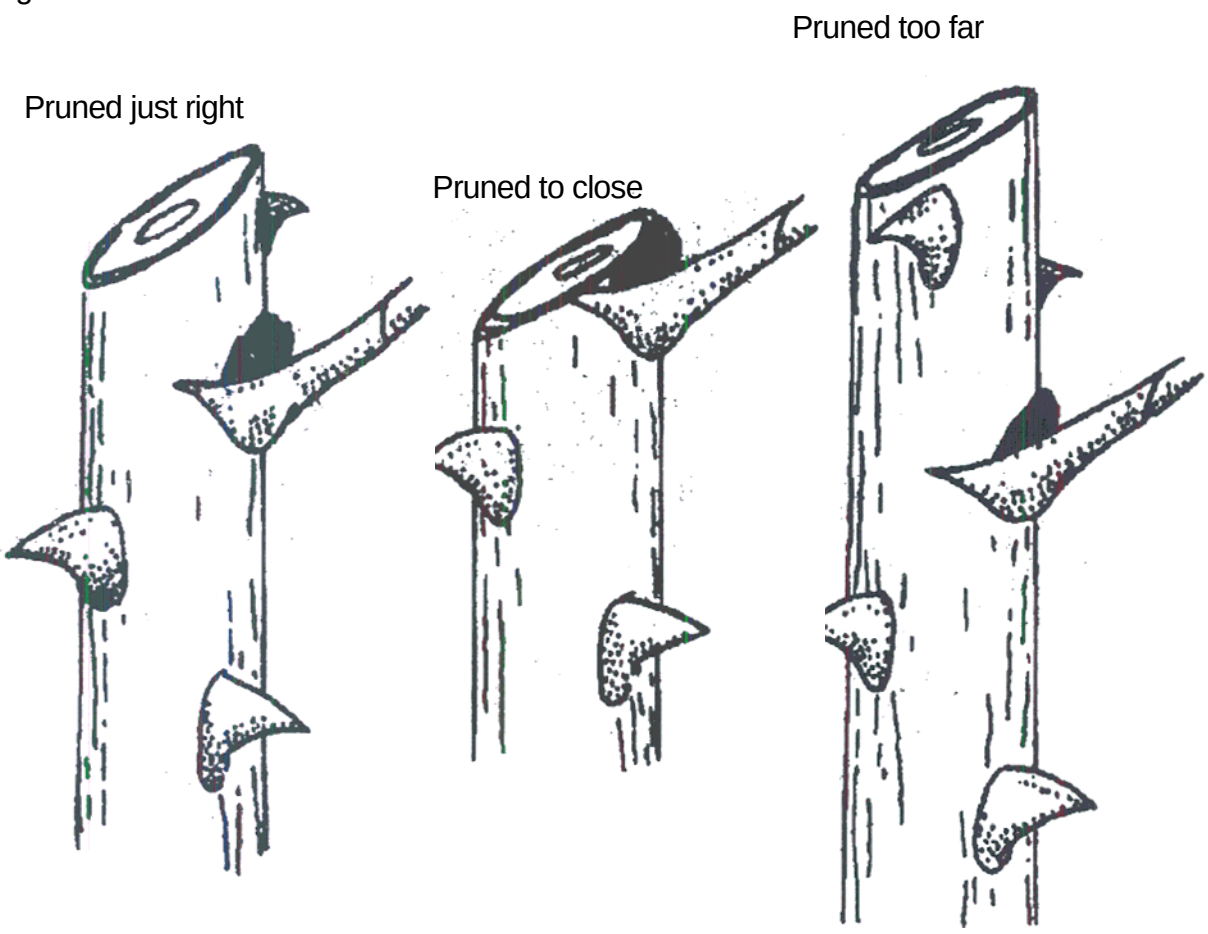
- ❖ Water roses thoroughly after planting. Fill pot with water and allow to flow freely from the bottom of the container. This should be done two times.

- ❖ Use an appropriate fungicidal drench to prevent downy mildew and an appropriate preventative treatment for Botrytis.

- Soil line should be 1" to 2" below the rim of the container so that water can collect and soak into the soil.

- Field pruning of canes after potting is an acceptable alternative to pruning prior to potting.

Pruning Illustration



GROWING LOCATION

SPACING

- Pot-to-pot spacing is acceptable immediately after planting.

- When first leaves are fully expanded, the roses need to be spaced with 16” between centers to assure good ventilation and light.

DO NOT DELAY SPACING AFTER SHOOTS BEGIN TO ELONGATE

- Provide good drainage. Roots will rot if they sit in water.

- Protect plants by placing them upon a porous weed barrier. They should not sit directly on the ground.

- Maximum sun exposure means maximum growth, but shading may be needed in warmest climate.

- If possible, the sides of hoop houses should be drawn back after the danger of frost is past to insure the plants harden-off before delivery to customers

REPORT ANY ROSES THAT DO NOT BREAK WITHIN TWO WEEKS AFTER POTTING TO JACKSON & PERKINS RESEARCH, BRIAN CORREIAR at 661-599-7091OR BCORREIAR@JACKSONANDPERKINS.COM AND JACKSON & PERKINS WHOLESALE AT 800-545-3444.

WATERING AND FERTILIZATION

PROPER WATERING IS VITAL TO THE HEALTH OF ROSE PLANTS

- "Water-in" plants thoroughly right after potting. Two saturating hand-waterings are best. If using sprinklers, run them until water flows from the pot weep holes.

DON'T LET THE POTS DRY OUT

- Watering frequency will depend on your climate and potting soil type.

MAINTAIN HUMIDITY DURING THE DAY

- Periodically, overhead mist plants during the day if humidity is below 30%.

- Overhead water frequently on hot sunny days that follow cloudy weather. Temperatures can soar and new foliage burn.

- Make sure foliage is dry two hours before sunset.

- Stop all overhead irrigation before 2 or 3 p.m. Regular watering should always be in the morning.

FERTILIZE DURING THE SECOND TO THIRD WEEK AFTER PLANTING

- Use a complete fertilizer (e.g. 20 – 20 - 20). If using dry fertilizer, 1 tablespoon per pot is adequate. When using drip systems and liquid feed, use a balanced formula with nitrogen at 150 ppm.

OR

- Fertilize with 20-5-30 monthly, starting at 5 weeks using 2 tablespoons per pot.

OR

- If using slow release fertilizer after potting, use a 90-day formulation.

- During rainy periods, fertilizer may leach out. Take EC readings at least every two weeks. Pots with readings below 1.6 need fertilizer.

NEVER APPLY FERTILIZER WITHIN 10 DAYS OF CUSTOMER SHIPMENT

Just prior to shipment, irrigate with clear water two times until water runs freely from bottom holes to leach out and lower EC.

PINCHING

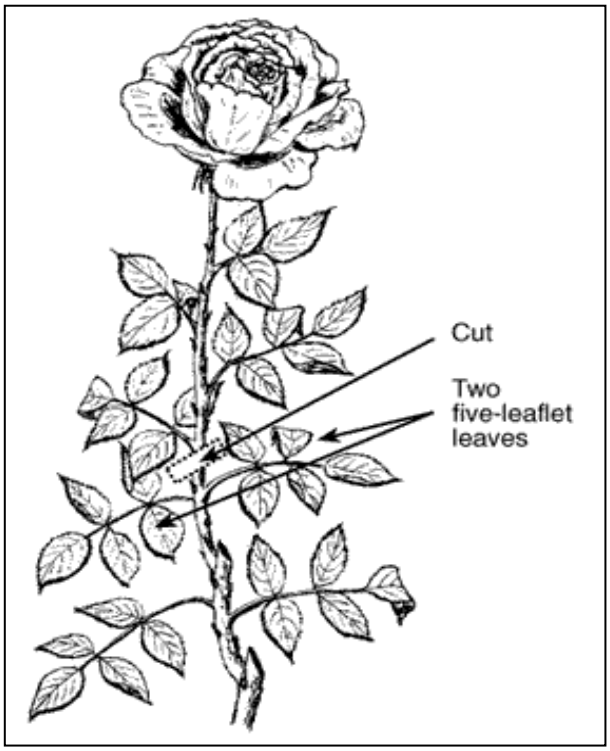
Artful pinching induces basal breaks and encourages more canes and more flowers from each cane pinched. This will ensure a high quality rose plant that is well received by the JPW customer and quickly sold to an eager gardener.

EFFECTIVE PINCHING

- Regulates the bloom cycle
    - Pinch 5-6 weeks before the rose ships to the customer for maximum color.
- Encourages plant building resulting in a fuller, bushier plant with more buds

PROPER PROCEDURE

- Use clean, sharp cutting implements.
- Cut each cane 1/4” above the second five leaflet from the terminal end of the growing stem. For bottom or basal shoots, cut 1/4” above a leaf node and at one half the length of the shoot.



SPECIAL CONSIDERATIONS FOR INDOOR (GREENHOUSE/HOOPHOUSE) GROWERS

- **Heating**
  - Plants should be in a heated environment when temperatures are reasonably anticipated to reach 35-36 F or lower.
  - Propane heaters should NOT be used as these produce ethylene. Ethylene will severely damage or kill roses.

- **Cooling**
  - Cooling should begin at any time that the temperature in the growing environment is reasonably anticipated to exceed 80 F.

- **Air Circulation**
  - Air circulation is key to preventing disease and ensuring an even temperature in the growing environment. Run fans in appropriate locations to ensure movement and mixing of air in the growing environment.

- **Relative Humidity**
  - The growing environment should be able to be vented to allow for management of relative humidity. High relative humidity may result in conditions favorable to disease.
  - Opening vents for two hours at sunset while running the heating system can push moist air out of the growing structure.

- **Hardening Off**
  - Roses grown indoors typically need to be hardened off before being sent to the end customer.
    - Cool down the growing environment a week prior to shipping. An ideal target temperature is 45 F.
    - Do not fertilize plants 1-2 weeks prior to shipment.
    - The last two irrigations should be with clear water applied in a sufficient amount to run freely from the bottom of the container.

SPECIAL CONSIDERATIONS FOR OUTDOOR GROWERS

- **FROST**
  - **Temperatures Dropping to the mid-20's**
    - Run overhead irrigation. This will form a layer of ice on the canes. As the ice melts, it produces heat and protects the plant.
    - Stack boxes, peat bales, and straw on the windy side
    - Space the roses pot-to-pot for heat retention.
    - Cover with plastic before dark. Remove the plastic during the day if the temperature rises.
    - Cover with shade screen and overhead water to form an ice crust.
  - **Temperatures Dropping to the low-20's and teens**
    - Overhead water to form ice.
    - Use a wind barrier.
    - Space pot-to-pot**.**
    - Cover with plastic if it is not snowing.
    - Cover with shade cloth and overhead water to form an ice crust**.**
    - If snowing, do not cover with plastic; let the snow cover.
  - **Post-Frost Treatment**
    - Inspect plants after the danger of frost is over.
    - Remove any damaged canes, tips, stems, and leaves
    - Spray with pesticide to prevent Botrytis.
- **WIND**
  - Sustained dry, windy conditions can dry our canes even when the potting media is moist. That is especially true for recently potted plants.
  - Keep canes hydrated by misting the plants.
    - For example: Mist canes with a 30-60 second spray every 30 minutes. Do not spray plants with large water droplets as doing so for extended periods can over-saturate the media.
- **HARDENING OFF**
  - Roses typically need to be hardened off before being sent to the end customer.
    - Do not fertilize plants 1-2 weeks prior to shipment.
    - The last two irrigations should be with clear water applied in sufficient amount to run freely from the bottom of the container.

DOWNY MILDEW

(*Peronospora sparsa*)

Symptoms

Angular purple, reddish, or dark brown spots on leaves, stems, or canes

White "downy" fungal growth may sometimes be seen on the underside of leaves

Leaves turn yellow and drop. In serious infections, the plants may appear burnt with leaves looking scorched.

GENERAL INFORMATION

A cool weather disease-develops at 41-80°F, optimally at 65°F
High relative humidity (85%) is needed
This disease develops rapidly. The pathogen can infect a rose after 3 hours of favorable conditions.

POST PLANTING

- Prevention is critical!
- Apply a soil drench with Subdue on the planted container.

MAINTENANCE

- SPRAY WEEKLY using a rotation of suggested fungicides (see Chemical Table). Be sure to cover the undersides of the leaves.
- Good ventilation and dry leaves are the best defense.
    - Space roses 16" between centers.
    - Cease overhead watering early enough in the day to allow leaves to dry before cool night temperatures set in.
    - Heat houses overnight. Two hours of heat in the middle of the night are enough. This works best if there is a vent to the outside, higher then the plants.

EARLY SPRING

- Cut ventilation holes at the base of the sides and in the top of the plastic of hoop houses or raise the skirts.
- Use fans for horizontal airflow.
- Open vents.
- Provide good drainage to prevent puddles.

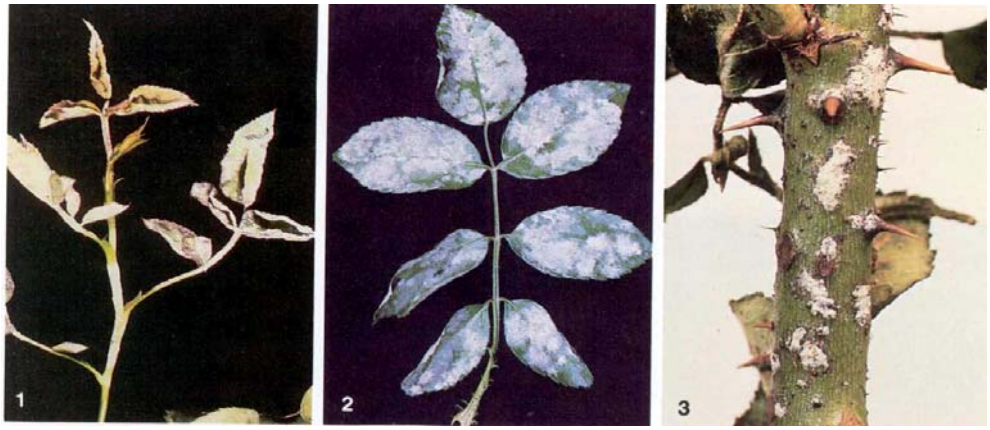
TREATMENT

BY THE TIME SYMPTOMS APPEAR, IT IS TOO LATE.

- Remove the affected plants immediately.

POWDERY MILDEW

(*Sperotheca pannosa*)



Symptoms
Early symptoms are leaf cupping and purplish blotches on the underside of leaves
White to gray growth on leaves, shoots, and buds
Affected leaves may become distorted and drop

GENERAL INFORMATION

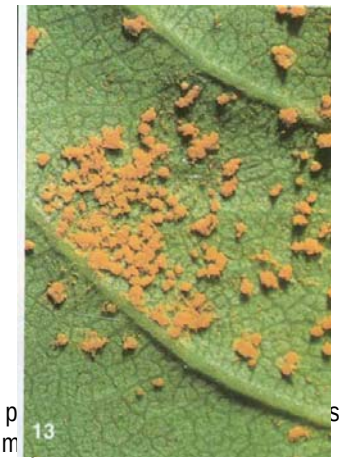
Powdery mildew develops in moderate temperatures (60° – 80°F)
High relative humidity at night (90%) is needed for the disease to develop
New leaves are most readily infected

PREVENTION

- Reduce night time humidity by watering early in the day
- Insure good air circulation by spacing plants far enough apart to allow airflow between all plants
- SPRAY WEEKLY. Powdery Mildew attacks new leaves. A new leaf unfurls almost daily, so sprays must be frequent to keep them protected.
- Use a rotation of effective fungicides to avoid developing resistance.
- Use surfactants with all dry powder formulations
  (See Chemical Table).

RUST

(*discoflora*)



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The upper surfaces of leaves may become yellow
Defoliation often occurs

GENERAL INFORMATION

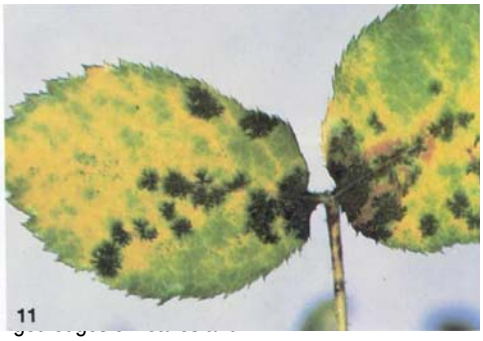
Several species affect roses, but garden roses are most commonly infected by *Phragmidium mucronatum* (*discoflora*)
Spread by wind or water-splashed spores
Mild temperatures and moist conditions favor infection

CONTROL

- Sanitation is very important, remove any infected plant material immediately
- Avoid getting water on leaves as much as possible
- Decrease spray intervals during rainy periods
- Do not let leaves stay wet longer than 5 hours at a stretch.
- Use a rotation of effective fungicides on a 7- to 10-day schedule.
- Maintain a regular spray schedule in areas with a known history of rust
- When it rains frequently, increase sprays of fungicides.
- Clean up sources of disease spores, such as leaves and organic debris

BLACKSPOT

(*Diplocarpon rosae*)



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young stems
Yellow zones may develop around the dark spots
Leaves may die and/or drop

GENERAL INFORMATION

The pathogen requires free water to germinate and infect plants
It can be spread by splashing water
The pathogen can survive on dead plant material

CONTROL

- Avoid getting water on leaves
- Sanitation is very important
- Remove any fallen leaves from pots and surrounding areas
- Prune out any affected plant tissue
- Use a rotation of effective treatments on a 7–10 day schedule
- Repeat treatment applications more frequently during rainy periods

BOTRYTIS

(*Botrytis cinerae*)

Symptoms
Twig, cane, or blossom dieback
Infected plant material may turn brown to black
Gray fungal growth may appear on infected parts

GENERAL INFORMATION

Botrytis blight can develop over a wide temperature range from freezing conditions up to about 60°F
The pathogen requires moisture to develop
Spores can survive in plant trash
Spores can be spread readily by pruning equipment
Typically occurs early in the season just as active growth begins

CONTROL

Sanitation is critical!

- Use a sterile potting mix.
- Store potting soil on a concrete pad or heavy mL plastic to avoid contamination.
- Use clean implements when pruning.
- Clean potting machines, potting benches, and vehicle beds.
- Remove dead leaves from pots and surrounding areas.
- Prune out dead plant material.
- Eliminate weeds and fallen leaves from hoop houses and fields.
- Manage irrigation and air circulation to minimize relative humidity.
- Spray with a rotation of effective pesticides on a 7-10 day basis while conditions are favorable for disease development.
- Remove plants that exhibit Botrytis and Contact the Container Rose Department for instructions

BE ALERT TO CONDITIONS FAVORABLE TO BOTRYTIS

- Watch for this spore born disease when there are prolonged, cool (less than 60° F) temperatures.
- Keep hoop house humidity under 90% through heating.
- Provide good ventilation.
- Stop overhead watering at least 2 hours before sunset to allow foliage to dry before cool night temperatures to set in.

INFESTATIONS

MITES

FAVORABLE CONDITIONS

- Hot weather is a signal to intensify mite inspection and preventative sprays.
- Wind, birds, clothing, and gloves all spread mites.

PREVENTION

- Overhead water during the day.
- Inspect weekly by brushing leaves over white paper and examine with a 10x or 20x magnifying glass.

IF MITES ARE PRESENT

- Hand spray webbing from plants.
- Rotate pesticides on a 7- to 14-day schedule, making sure to cover the undersides of foliage.

SPRAY TECHNIQUE

- STEP ONE: Start at the base of the plant, spraying the underside of leaves with the nozzle facing up.
- STEP TWO: Continue from the top of the plant, turning the nozzle down and spraying down the plant.

THRIPS AND APHIDS

- When plants are just beginning to unfurl leaves, treat pots with systemic Marathon. If Marathon is not registered in your state, use Orthene at two-week intervals. Spray with Mavrik on alternate weeks.
- Spray every 7 to 10 days, using a rotation of effective pesticides (see Chemical Table).
- Thrips and aphid damage quickly lowers rose plant quality. Prevention is critical.

BEETLES AND WORMS

- Look for black, pellet-like worm droppings on foliage. The droppings are often easier to spot than the worms.
- Check for folded-over leaves and among flower petals.
- Spray when present with an effective insecticide listed on the Chemical Table.