Rehbein
ENVIRONMENTAL SOLUTIONS

## Choosing the Right Sand

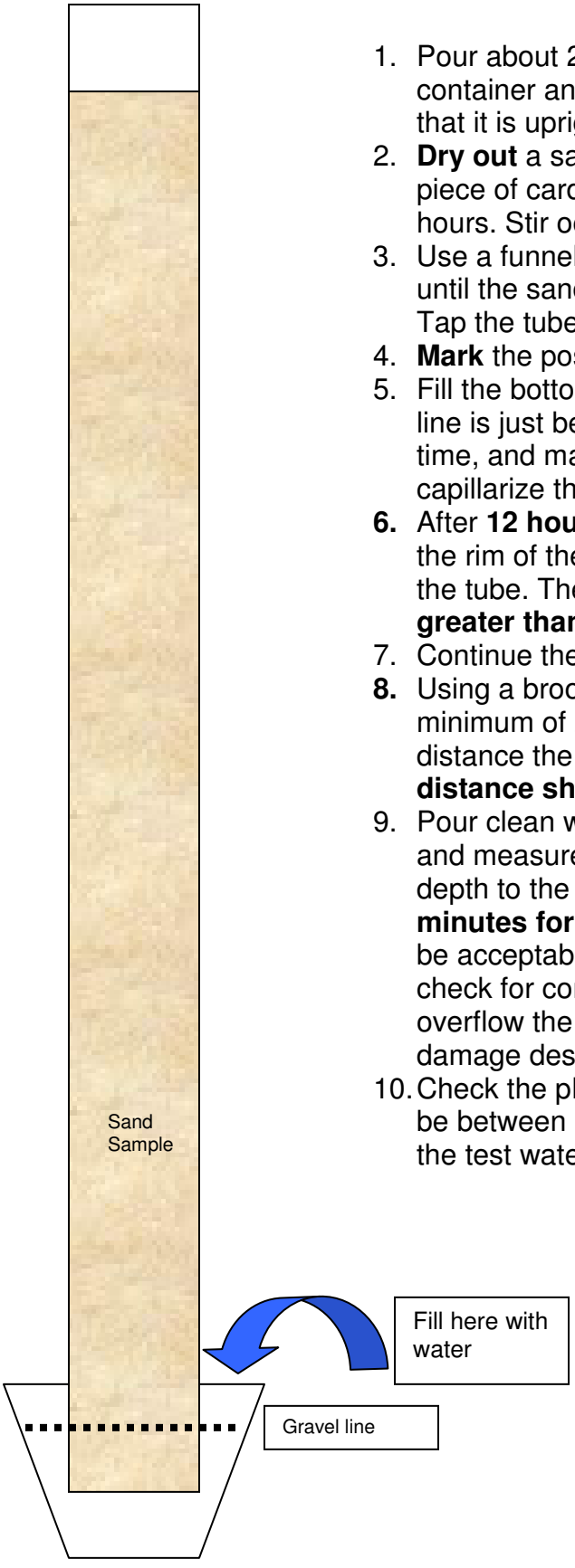
The largest component of the EPIC growth cell is the sand bed that surrounds the irrigation unit. The sand's function is to transmit moisture and nutrients through capillary action into the root zone layer. Sand quality and variety can vary from quarry to quarry and its mode of manufacture. Although a variety of sands have been successful in EPIC beds, it is important that certain minimum precautions be observed.

1. The sand should at least be advertised as "washed sand", where most of the silt and clay particles have been removed. A quick field check is to swirl a half-cup of sand with water and to observe the settling and color characteristics of the overlaying water. If the water stays relatively clear and the particles settle quickly to the bottom, the sand is relatively free of silt and clay. If the water becomes muddy and does not settle out quickly, the sand is not acceptable due to the clogging small particle content of silt and clay.
2. The pH of the sand should be in the neutral range (6.5-7.5). Some sand manufactured from certain crushed rock may be too alkaline for good root growth. A quick field check is to check the pH of the water after it has been in contact with the sand for a few minutes.
3. The sand should feel "gritty" when rubbed between fingers, crumble readily when dry, and absorb water quickly when water is poured on top of it.

Ideal sand for the technically inclined should have 90 - 100 percent of its particles between 0.2 and 1.0 mm in diameter. Within this range, the medium sized particles, with a diameter of 0.50 to 0.25 mm, should comprise at least 50 to 70 percent.

| *CLASSIFICATION* | *PARTICLE SIZE (mm)* | *SIEVE #* | *ACCEPTABLE RANGE (%)* |
|---|---|---|---|
| *Fine Gravel* | *2.00 and up* | *10* | *0-10* |
| *Very Course Sand* | *1.00 - 2.00* | *18* | |
| *Course sand* | *0.50 - 1.00* | *35* | |
| **Medium Sand** | **0.25 - 0.50** | **60** | **82 - 100** |
| *Fine Sand* | *0.10 - 0.25* | *140* | |
| *Very Fine sand* | *0.05 - 0.10* | *270* | *0 - 8* |
| *Silt and Clay* | *under 0.05* | *-* | |

# Evaluating Sand for Suitability
# In EPIC systems




1. Pour about 2” of fine gravel in the bottom of a small glass container and insert the clear plastic tube into gravel such that it is upright and self-supporting.
2. **Dry out** a sample of sand thoroughly by spreading out on a piece of cardboard, and leaving it out in the sun for a few hours. Stir occasionally to accelerate drying time.
3. Use a funnel and pour the dry sand down the top of the tube until the sand is approximately 1” from the top of the tube. Tap the tube sides with fingertips to promote normal settling.
4. **Mark** the position of the sand at the top of the tube.
5. Fill the bottom glass container with water such that the water line is just below the rim of the glass, record the starting time, and maintain the water level as the sand starts to capillarize the water. Refill as needed.
6. After **12 hours** measure the distance of capillary rise from the rim of the glass to the top of the visible moisture level in the tube. The moisture rise for acceptable sand should be **greater than 10”.**
7. Continue the capillary rise until the entire column is moist.
8. Using a broom handle end compress the damp sand with a minimum of 20 psi weight pressure, and measure the distance the sand sample compresses. **The compression distance should be less than 1”.**
9. Pour clean water on top of the sand column to a 1” depth and measure the time it takes to fully drain away the 1” water depth to the top of the sand. It should take **less than 10 minutes for the water column to drain** for the sample to be acceptable. Repeat the drain process three times to check for consistency in drainage readings. ( note : water will overflow the glass container – make provisions not to damage desk surface)
10. Check the pH of the water in the glass container. It should be between **6.5 – 7.5**, or not vary significantly from the pH of the test water used.