

Nursery Water and Nutrient Management Best Management Practices Checklist

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Water Management

Determine water and nutrient runoff levels

Use Whole Nursery Recycling

Use Recirculating Subirrigation Systems

- Ebb and Flow trays, benches or floors

- Trough Systems

- Capillary Mats with return

Improve irrigation efficiency and uniformity

- Properly engineer and maintain overhead systems

 - Replace worn heads

 - Use proper pressure and head sizes

 - Install pressure regulating control valves

- Use same types of heads and emitters on a single valve

- Hire an irrigation consultant to evaluate system

- Conduct catch tests/ water audits

- Convert to drip or other low volume emitter

- Use anti-drain emitter and check valves

- Correctly position spray stakes to avoid overspray

- Install valves on each sprinkler/block so that only planted areas are irrigated

Use catch trays

Improve pressure uniformity by shortening runs or manifolding in middle of block or bench

Group plants by

- container size

- age

- water requirements

- nutrient requirements

- salt tolerance

Fill and pack containers uniformly

Use correct container spacing

Consolidate plants and shut off sprinklers or emitters in unused sections

Evaluate soil physical properties to maximize water-holding capacity while maintaining adequate aeration

Use wetting agents to reduce channeling and rewetting problems

Use tensiometers with or without computer control

Use pulse irrigation

Use computer controlled solenoids

Use CIMIS or other ET data to determine crop water requirements

Repair leaking valves, faucets

Train and supervise irrigators

- How to evaluate soil moisture and the need for irrigation

How long to apply water to rewet and accomplish any required leaching
To quickly replace or repair damaged, clogged, out-of-place irrigation equipment
Evaluate leaching fraction requirement(In a uniform system it is probably lower than you think). Evaluate maximum allowable soil EC for a given crop.
Use tail-water to irrigate perimeter landscapes

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Nutrient Management

Test runoff for nutrients / pesticides (routinely)
Use Constructed wetlands or vegetative filter
Use microbial denitrification or other form of nitrate removal
Test runoff for nutrients / pesticides (routinely)
Test irrigation water to determine:
 Suitability for irrigation
 Leaching requirement
 Natural Nutrient inputs
 Acid or special nutrient needs (i.e., sulfur, magnesium, boron)
 Potential for small orifice clogging (carbonates, iron, manganese)
Use dual or triple lines in liquid feed programs (clear, low and high feed)
Calibrate injector pumps
Test line water for nutrient levels
 Complete tests at a qualified laboratory
 In-house nitrate, phosphorus, potassium
Design and adjust liquid feed nutrient programs based on
 Soil properties
 Existing nutrient levels in well, reclaimed or recycled water
 Routine soil and or plant analysis
 Individual crop requirements
 Stage of growth (reduced input at flowering for many floral crops)
 Environmental conditions
 Irrigation method (reduce input in high-efficiency, minimal leaching regimes)
Reevaluate use of high phosphorus blends
Use multiple tank systems to independently adjust nitrogen and other nutrients
Avoid precipitation/solubility problems in concentrate tanks
Use a conductivity meter
 To detect changes in water quality
 To avoid catastrophic fertilizer application
 To monitor injector efficiency
 To monitor and determine recycled water blends
 To do in-house pour-through, saturation extract or squeeze method soil salinity testing
Use clear water irrigations for salt management

Calibrate fertilizer hoppers and spreaders
Store fertilizers correctly
Analyze soil mix components
Nutrient levels, pH, salinity, particle size, C/N ratio
Avoid rapidly decomposable wood residuals with high nitrogen demand (i.e. pine and hardwood sawdust)
Use nutrient rich composts (greenwaste, manure, biosolids, dump soils) in correct proportions
Check soil mixing process to ensure uniform blending of bulk ingredients and fertilizer
Adjust soil mix nutrients and lime additions based on soil test results and recommendations

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Use controlled release fertilizer (CRF) alone or in combination with liquid feed
Plant into soil blends containing CRF shortly after mixing to avoid early nutrient release
Locate soil mixing areas away from surface runoff
Check to make sure that CRF is not damaged during transit, storage or soil mixing
Make sure topdressed fertilizer lands in and stays in container
Test nutrient release of CRF through plant and/or soil analysis
Keep accurate planting date and soil mix records to determine most likely dates to reapply CRF
Adjust CRF rates and formulation depending on
Soil mix properties
Individual crop nutrient needs
Desired rate and duration of release
Environmental conditions (expected temperatures)
Irrigation method
Other nutrient inputs
Apply foliar nutrients (appropriately timed, without runoff, on responsive crops)
Install and maintain backflow preventers
Seek advice from Farm Advisors, Certified Crop Advisors
Read Nursery BMP Manuals available from universities and Cooperative Extension
Solicit ideas from all nursery staff
Stay informed!