**Channel Islands Potting Soil – Current Practices**

**PLEASE EMAIL ANY EDITS/SUGGESTIONS TO JULIANA\_MATOS@NPS.GOV**

Importing potting soil from the mainland to the Channel Islands for nursery operations poses a biosecurity risk to the native island ecosystems. The purpose of this document is to identify current practices being used by the various land managing entities on the Channel Islands so that recommendations for best practices can be provided. While there may not be a one-size-fits-all solution, this is an opportunity for knowledge sharing and improving upon current practices where appropriate.

This document was developed with input from staff at Channel Islands National Park, California Institute of Environmental Studies, Naval Base Ventura County San Nicolas Island, San Diego State University on behalf of Naval Base Coronado San Clemente Island, and the Catalina Island Conservancy.

Biosecurity risks from potting soil

* Nonnative insects, gastropods, and other critters from the mainland on outside or inside of packing material
* Holes or punctures in packing material allowing for insects or pathogens to contaminate the material
* Long-term storage of materials results in increased chances of infestation
* *Risks specific to San Clemente Island*
  + Insects and pathogens in unpasteurized soil may get out when the soil is being stored in its trashcan
  + Insects and pathogens may get into the pasteurized soil or sand bins from the unpasteurized peat moss/perlite/vermiculite bins that are stored nearby
  + Insects and pathogens may reinfect pasteurized soil/sand when trays are left out overnight to cool

Current biosecurity protocols used to minimize risks

* Inspect packing materials for insects, gastropods, and other critters
* Only select bags without holes, whenever possible
  + When using delivery service, visually inspect all bags for holes before clearing for transport
    - *TIP: American Horticultural Supply (AHS) will replace bags at no cost if you take photos of bags with holes/rips)*
    - Schedule soil delivery as close to transportation time as possible to minimize contamination
    - If there is a lag between delivery and loading onto transport vessel, store soil indoors to minimize contamination
* Use source like AHS, which has its warehouse indoors and keeps soil on full pallets that are shrink-wrapped as kept elevated off the ground
* Soil constituents are kept in clean, sealed rolling garbage cans
* Plants in pots are kept on biosecure tables meant to exclude ants and snails from getting into stock plants
* During grow-out process and prior to out-planting, plants are routinely monitored for pests and treated as needed
* *Protocols specific to San Clemente Island*
  + Potting soil and sand are pasteurized in an oven before use.
    - Potting soil bags are opened and dumped into a 32-gallon trash can with a lid for easy access during pasteurization process. The trash can is stored near the other unpasteurized material on the open-air concrete pad.
    - Sand bags are opened and dumped into a five gallon bucket with a lid for easy access during the pasteurization process. The five-gallon bucket is stored next to the unpasteurized potting soil trash can.
    - Soil or sand is placed on a deep metal baking tray, covered in foil, and placed into an oven set to 250° F / 120 C for about 2 hours. Meat or soil thermometers are poked into the soil/sand to monitor temperature. A tray of soil/sand must be at 180° F for at least 30 minutes to be considered pasteurized. We have a note to not let the soil exceed 212° F because then it can release toxins.
    - The trays are pulled out of the oven and left on a table, with the foil on, for approximately 30 minutes to ≥ 12 hours to cool before the soil is brought into the greenhouse to be stored.
  + Media storage inside the greenhouse is a series of lidded 32-gallon trashcans and five-gallon buckets on wooden pallets.
    - Pasteurized potting soil is stored in a 32-gallon trash can with a lid.
    - Pasteurized sand is stored in a five-gallon bucket with a lid.
    - Peat moss, perlite, and vermiculite are not pasteurized and are stored in trash cans with lids next to the pasteurized media trashcans.
* *Protocols specific to Catalina Island*
  + Bags are stored in shipping container, stacked on wooden pallets on top of a concrete pad outside of the hoophouses at center of nursery
  + Potting soil and sand have not historically been sterilized before use, but now have the equipment necessary and will begin to do so in 2022
  + The following recipe is used for one batch of potting mix:

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| **Basic Potting Mix** | | **Seed Mix** | |
| **Constituent** | **Quantity** | **Constituent** | **Quantity** |
| Coir | 5.6 cu. ft. (4 bags) | Coir | 1.4 cu. ft. (1 bag) |
| Conditioner | 3 cu. ft. (1 bag) | Conditioner | 1.5 cu. ft. (0.5 bag) |
| Sun-Gro Fertilizer | 1 cup | Vermiculite | 1 cu. ft. (0.25 bag) |
| Vermiculite | 4 cu. ft. (1 bag) | Perlite | 2 cu. ft. (0.5 bag) |
| Perlite | 4 cu. ft. (1 bag) |  |  |

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**POTTING MATERIALS CURRENTLY USED**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Island | Potting Soil | | Perlite | | Sphagnum Peat Moss | |
| **Product** | **Source** | **Product** | **Source** | **Product** | **Source** |
| San Nicolas Island |  |  | ✓ | N/A | ✓ | N/A |
| San Clemente Island | Miracle Gro Potting Mix | Home Depot in SD (pickup) | Therm-o-rock | AHS in San Marcos (pickup) | SunShine and Sun-Gro | Home Depot in SD (pickup) OR AHS in San Marcos (pickup) |
| Channel Islands National Park | [Berger Mix 6 BM6 General Use - Berger](https://www.berger.ca/produits-horticoles/bm6-utilisation-generale/) | AHS in Oxnard | - | - | - | - |
| Catalina Island | G&B Soil building conditioner (compost) | Kellogg Garden Products | ✓ | Kellog Garden Products | - | - |

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| **Island** | **Vermiculite** | | **Sand** | | **Fertilizer** | | **Seed Starting Mix** | |
| **Product** | **Source** | **Product** | **Source** | **Product** | **Source** | **Product** | **Source** |
| **San Nicolas Island** | ✓ | N/A | ✓ | From on-island dunes | - | - | - | - |
| **San Clemente Island** | Therm-o-rock | AHS in San Marcos (pickup) | Quickrete Washed Plaster Sand | Home Depot in SD (pickup) | Liquid fertilizer/fertilizer beads. No bagged manure fertilizer | N/A | - | - |
| **Channel Islands National Park** | - | - | - | - | [Osmocote Osmocote® 14-14-14, 3-4M | ICL Specialty Fertilizers (icl-sf.com)](https://icl-sf.com/us-en/products/ornamental_horticulture/osmocote-a90550-14-14-14-3-4m/) | AHS in Oxnard | [Berger Mix 2 BM2 Seedlings - Shepherd (berger.ca)](https://www.berger.ca/produits-horticoles/bm2-semis/) | AHS in Oxnard |
| **Catalina Island** | ✓ | N/A | ✓ | Washed beach sand from Catalina (Little Harbor) | 4-4-4 All-Purpose Fertilizer | Kellogg Garden Products | - | - |