

# Seed Propagation for *Sonneratia alba*



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## *Sonneratia alba*



Locally known as Pagatpat (Family Sonneratiaceae), *Sonneratia alba* is the dominant mangrove species in seaward areas with mud and sand substrate, and high salinity water.

Pagatpat can effectively withstand conditions of wind exposure and wave action, and are excellent for coastal protection. To use them for reforestation, however, they need to be propagated in nurseries. While mangroves bear fruits every year, seed propagation and nursery operation are not commonly practiced. And particularly for Pagatpat, there is very limited information on how to propagate their fruits or seeds.



For. Eric D. Buduan of Philippine Tropical Forest Conservation Foundation, Inc. (PTFCF), and Roberto A. Ballon of Kapunungan sa Gagmay'ng Mangingisda sa Concepcion (KGMC) in Kabasalan, Zamboanga Sibugay developed practical and effective methods to propagate Pagatpat seeds and produce seedlings.

This simple guide is expected to promote the planting of Pagatpat along seafronts, where they are most appropriate, and helpful in shielding communities against strong winds and storm surges.

## Seed Propagation for *Sonneratia alba*



### 1. FRUIT COLLECTION, SEED EXTRACTION AND PROCESSING

- Select quality parent trees with mature fruits (usually in July-September); and collect fruits through handpicking, shaking, or using poles to shake twigs and branches. Apply force that is just enough for the mature fruits to fall.
- Macerate the collected fruits by pressing the center of the fruit and separating the seeds from the pulp. Then soak the seeds in freshwater or preferably rainwater to determine the viable seeds (those that float) from the non-viable ones (those that sink). Then wash the collected viable seeds thoroughly with freshwater or rainwater.
- To break seed dormancy, sun dry the seeds for 1-2 hours depending on light intensity, as too much drying may negatively affect seed viability.



## 2. SEED GERMINATION

- Germinate seeds in areas with a soft muddy substrate (i.e. abandoned fishponds, or open areas in-between mangrove trees), with a few growing Pagatpat wildings (indicator of suitability), and can be reached by tidewater. Where there's none, construct a seedbed laid with canvas/ tolda then fill up with excavated

soft mud substrate. Allow the mud to dry for an hour to let the nutrients/acid evaporate before sowing the seeds.

- During low tide, scatter the seeds in the mud and cover them with black bean net (mesh #23) to prevent from being washed away by tidewater. Hold the net with stones or pegs along the edges. The seeds germinate in 3-5 days.



## 3. SEED SOWING AND GROWING

- Handpick the germinating seeds along with the mud substrate and broadcast in growing beds. Ideally, it is an abandoned pond with minimum of 15 cm deep mud substrate devoid of vegetation and can be reached by high tide.

- Scatter the seeds sparsely with density of max. 50 seedlings/ m<sup>2</sup> to avoid overcrowding and facilitate mud balling and transplanting later on.

- Allow at least 4 months for the seeds to grow as seedlings. Install barriers and signboards to protect from human disturbance.



- For nursery (bagging) operation, transplant the germinated seeds into plastic bags (5"x8") after 1-2 weeks or when the seedlings have at least 2-3 leaves. Use improvised transplanter (PVC ½ inch diameter, 6 inches long) to prevent damage and stress to the seedlings. Then tend them

in a nursery for 4-5 months depending on growth and planting site condition. Exposed seaward areas require more mature seedlings for better survival. Water the potted seedlings regularly with mud and saltwater to ensure replenishment of nutrients and soil lost to percolation and leaching inside the bag.

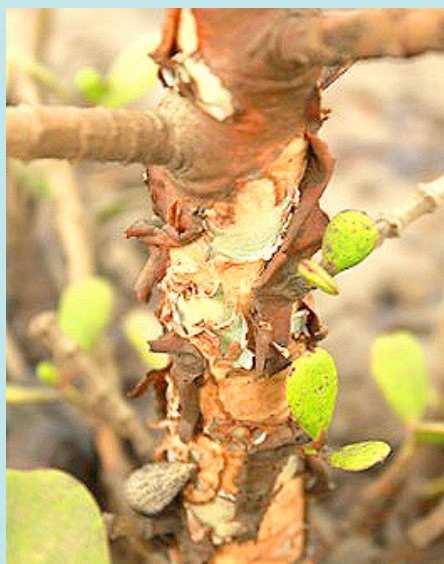
## 4. SEEDLING BAGGING OR POTTING

- Outplant the seedlings after 4-5 months or when they are at least 15 cm in height. This requires mud-balling of seedlings by cutting the mud substrate around the root system and lifting the seedlings and mud. Mud-ball must have dimension of at least 10 cm from the base of the seedling.

- Put the mud-balled seedling in a plastic bag to prevent mud/ soil from breaking and for easier handling and transport.



## 5. PLANTING



vegetation (i.e. smaller seedling must be planted adjacent to existing mangroves or nearer the shoreline while taller trees must be planted in seafront areas). Trial planting or checking of naturally growing Pagatpat may be conducted to ensure suitability.

- Remove plastic bags to enable the root system to grow and develop faster. Dispose plastic bags accordingly.
- Use the recommended spacing of 4m x 4m. Use closer spacing of 2m x 2.5m only if thinning will be done after 3-4 years for them to develop their stems and crown.
- The bark of Pagatpat seedlings are regularly shed-off (as part of its growth and development) together with barnacles and other attached fauna, thus, barnacle infestation is not a problem.
- Monitor growth (height and number of branches) every three months.

- Transfer seedlings to planting area by boat or raft.
- For seaward areas, plant from the last existing mangrove vegetation and extend up to 5 meters only (depending on substrate and tidal condition). The size of seedlings must be inversely proportional to the distance from the existing

## Steps in Seed Propagation for *Sonneratia alba*

1. Collect mature, viable fruits from identified parent trees.
2. Extract the seeds and wash with fresh water or rainwater.
3. Dry for no more than 2 hours under direct sunlight.
4. Sow the seeds in areas with soft, muddy substrate; or on a seedbed laid with canvas/tolda. Cover it with black bean net and allow the seeds to germinate in 3-5 days.
5. Once germinating, collect the seedlings along with the mud substrate and broadcast in growing beds. Allow the seedlings to grow for at least 4 months, then transplant them in identified restoration areas by mud-balling the seedlings. Place the mud-balled seedlings in plastic bags to facilitate transport and handling.
6. For nursery (bagging) operation, transplant the seedlings after one to two weeks or when the seedlings have at least 2-3 leaves. Allow them to grow for 4-5 months, regularly watering with mud and saltwater, before outplanting.
7. When planting in seaward areas, start from the last existing mangroves and extend up to 5 meters only with spacing of 4m x 4 meters. Consider planting smaller seedlings adjacent to existing mangroves while taller seedlings in seafront areas. Remove plastic bags and dispose them accordingly.
8. Protect and monitor the outplanted seedlings regularly (at least every 3 months).

## MATERIALS NEEDED:

- Mature Pagatpat fruits
- Basin
- Supply of freshwater or preferably rainwater
- Canvas/tolda
- Black bean net (mesh #23)
- Stones or Pegs
- Mud
- Barriers or signboards
- 5" x 8" plastic bags for nursery (bagging) operation
- Improvised transplanter (PVC 1/2 inch diameter, 6 inches long)
- Boat or raft for hauling
- Bamboo sticks