

## What is a Chinampa?

When Hernando Cortes and his men entered the Basin of Mexico in 1519, they found the natives employing a unique agricultural system.

This method of farming, which still persists today, consists of land reclamation through the construction of chinampas in marshy areas and shallow lakes. As the farmers or *chinamperos* dig out canals in the lakebed, they pile the mud which they are scooping out atop sedges and reeds. These constructed mounds, which are surrounded by water on at least three sides, are chinampas and serve as the garden plots in which the people grow their crops.

Homes are also constructed atop the chinampas. Each chinampa, or “floating garden” as they have been erroneously described, is between fifteen and thirty feet wide and 300 feet long and is no more than a few feet above the water level (Coe 1964).

Posts or woven vines and branches hold the sides of the chinampa plots in place. Chinamperos also plant willow trees (*Salix*) on chinampa edges to prevent erosion. The word *chinampa* is derived from the Nahuatl words *chinamitl* which means “an enclosed bed surrounded by cane or stakes” and *pan* which translates to “on or above the surface” (Moriarty 1969).

Prutzman (1988) delineates seven steps in chinampa construction. First, chinamperos use a long pole to find an adequate base for a chinampa and when possible use a *cimiento*, the remains of an old chinampa, as the foundation. Next, strong reeds are “stuck” in the bottom to mark the base dimensions. Third, farmers dig mud from around the base and pile it atop the reeds and *cimiento*. “Fourth, mats of water vegetation [are] cut and towed to the new chinampa.” These dense vegetative mats or *cesped* were principally water lily and tule (Outerbridge 1987). “Fifth, a compost heap [is] created by layering the mats of vegetation on top of each other until there [is] a thick cap of vegetation.

Sixth, mud from the bottom of the lake [is] mixed with soil from an old chinampa and placed on top, reaching a height of about one foot above the water level.

A porous base rich in organic matter [is] thus created through which water easily flowed. Lastly, the sides [are] secured with woven reeds, and then willow trees, *Salix bomplandiana*, [are] planted around the edges.”

An alternative view of chinampa construction is presented by Wilken (1985). Unlike Prutzman and others, Wilken asserts that aquatic plants have no structural role in chinampas; rather, he believes that plots are constructed by “simply extending drainage canals out into swamps or shallow lakes or back into low-lying shores” and then piling the excavated material onto spaces between the canals. While the dredged mud inevitably contains aquatic plants, these plants are not important structural component.

Regardless of which view of construction is correct, it is clear that chinampas are effective at drawing moisture.

Seepage from the surrounding canals keeps the soil continually moist at root level so as to provide crops with permanent irrigation (Armillas 1971).

If conditions became so dry as to not permit adequate infiltration, the chinamperos then resort to hand-watering their plants.

The canals, which in the past provided the natives with an important part of their diet (fish, crustaceans, waterfowl, salamanders), also serve as “thoroughfares” for the farmers’ flat-bottomed canoes

(Coe 1964).

To ensure that their crops have a fertile matrix in which to grow, the farmers scoop mud from the lake bottom with a *zoquimaitl*

(canvas bag attached to the end of a long pole), transport the mud to the chinampa with their canoe, and then spread the mud on the chinampa surface. This is done before each planting. Moreover, farmers often have a “favorite spot” for obtaining nutrient-rich mud (Prutzman 1988).



Green manuring with aquatic plants was another traditional method for fertilizing the soil. After collecting the plants in their canoes and bringing them to the chinampas to cut and dry, farmers would turn them into the soil green (Outerbridge 1987).

During the times of Aztec rule, chinamperos also used human waste to fertilize their plots. Bat guano from the caves of Guerrero and Morelos was also incorporated into the system, primarily when sowing chile peppers and tomatoes (Outerbridge 1987).

Crop rotation and crop diversification were additional methods which promoted soil fertility.

Chinamperos also periodically scrape off the surface soil of their chinampas (Parsons 1985). This action serves to either remove soil that is “salt-charged” or to lower chinampa height so that crop roots can have adequate access to water.

The chinampa system is quite both labor and space intensive; farmers use minimal land very efficiently.

With the exception of maize, farmers do not sow seeds directly into their chinampas; instead, they use the technique of the seed nursery or *almacigo*. Coe (1964) provides a clear description of this practice.

The nursery, at one end of the chinampa near a canal, is made by spreading a thick layer of mud over a bed of waterweeds.

After several days, when the mud is hard enough, it is cut into little rectangular blocks called *chapines*. The *chinampero* makes a hole in each *chapine* with a finger, a stick or a small ball of rag, drops in the seed and covers it with manure, which now comes from cattle but in Aztec days came from humans.

For protection against the occasional winter frosts the seedbed is covered with reeds or old newspapers. During dry weather the sprouting plants are watered by hand. Finally each seedling is transplanted in its own *chapin*

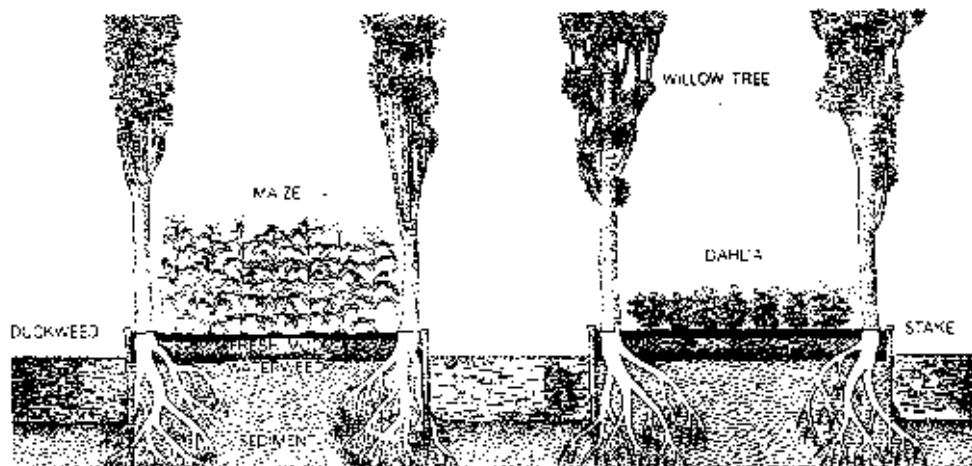
to a place on the chinampa, which has been cultivated and leveled with a spade or hoe (the Aztecs employed a digging stick called a *coa*) and then covered with canal mud.



Using a seed nursery is an integral aspect of the chinampa's high productivity. Only healthy seedlings are transplanted into a chinampa, so no space is wasted. Moreover, farmers time the harvesting of one crop with the transplanting of another, so the chinampa is always in continual use. Year-round production ensures that farmers harvest at least two to three crops a year.

As for the willows which line chinampa edges, they serve various functions in addition to maintaining mound structure and preventing erosion.

Planted at four to five meter intervals, the willows provide shade, serve as a windbreak, and attract beneficial birds and insects. They also are a source of firewood and construction material.



**All three images (chinamperos scooping mud, almacigo with individual chapines, and chinampa cross-section) taken from Coe (1964).**