Tepary bean: Nutritious and drought-hardy crop for climate adaptation in Mesoamerica

Tepary bean (*Phaseolus acutifolius)* is a legume crop that originated in the southwestern United States and central Mexico and is grown as far south as El Salvador. Although tepary bean was once widely used in the Sonoran Desert and other arid regions of North America, its production declined as a result of the development of modern, mechanized irrigation techniques after World War II that enabled a shift to other crops. Today, most tepary bean is produced by subsistence farmers for household consumption but wider use of this crop has potential to support climate change adaptation of Mesoamerican farm systems.

General features

Tepary bean is more drought tolerant than other types of beans, and may grow in areas with as little as 40-170 cm of annual rainfall. Drought tolerance is owed to its deep root system, which also enables resistance to soil salinity. In dry areas where water is now declining, farmers are able to use traditional floodwater management methods such as catchment basins and construction of canals to grow tepary bean.

Nutrition

Tepary bean has a rich, nutty taste and is an excellent source of fibre, carbohydrates, and protein. It has similar energy, protein, fat and carbohydrate levels as other commonly grown beans in Mesoamerica (e.g. black and red varieties of *Phaseolus vulgaris*). Although tepary bean is low in the amino acids Tryptophan, Methionine, and Cysteine, these amino acids and other complementary nutrients are obtained by eating it in combination with maize and squash. Antinutrients present in tepary bean include trypsin inhibitors that reduce the bioavailability of active trypsin needed for protein digestion, and lectins, which cause red blood cells to agglutinate. Due to the levels of antinutrients in tepary bean, it is considered toxic in its raw state and must be thoroughly cooked before eating. Heat from cooking tepary bean inactivates its antinutrients.

White tepary bean. Credit: Bioversity International/G. Meldrum

Black tepary bean. Credit: Bioversity International/G. Meldrum

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Processing

Harvesting of tepary bean presents a challenge as the pod shatters easily at maturity. For small harvests, beans are shelled by hand, although the small seed size makes this process burdensome. Alternatively, threshing involves walking on the pods or beating them with a flail made from a saguaro cactus (*Carnegiea gigantea*) rib or a mesquite (*Prosopis* sp.) tree branch. For larger harvests, a threshing floor may be used: The tepary vines are spread over a round depression and a mule or horse is roped to a post in the center and driven around over the vines to crush the pods. The beans are dried before use.

Prior to cooking, tepary beans must be soaked in water for as long as 12 hours. Fresher beans require less time for soaking. Long cooking times, up to three hours, can prove difficult for poor communities where fuel supplies are limited. Cooking times can vary depending on the freshness, production location, seed type, and other factors. Long cooking times are also typical for other beans and precise data comparing cooking times of tepary to other beans are scant, especially for conditions that are typical for rural communities in Mesoamerica.

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Ingredients

1 c tepary beans
1 c whole parched corn
Beef chicharrones (pre-cooked)
1 tsp salt
1 clove garlic
4 c water
1 red chile (optional)

Preparation

Soak beans for a minimum of 12 hours. Once the beans have been thoroughly soaked, put all the ingredients (including tepary beans) in a large pot, except for the meat, and boil for about 3 hours. During the last ½ hour of cooking, add the chicharrones. Serve, adding chiltepines to taste.

Credit: Niethammer, C., 1983. Tepary Cuisine. Desert Plants. [online] Available at: <http://arizona.openrepository.com/arizona/handle/10150/552172> [Accessed 24 Jan. 2017].

Tepary bean in Chiquimula, Guatemala/ Credit Universidad del Valle de Guatemala/ Ing. Emerson Hererra

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