

# Cultivation and Use of Teparies in Sonora, Mexico

S. J. Bouscaren

Department of Anthropology  
University of California, Riverside

J. G. Waines

Department of Botany and Plant Sciences  
University of California, Riverside

and

L. A. Boykin-Bouscaren

Department of Education  
University of California, Riverside

The tepary bean (*Phaseolus acutifolius* A. Gray) in Sonora constitutes a crop represented by land races. There is no evidence that this bean has been hybridized by man in either the U.S.A. or Mexico. Fr. Juan Nentvig (1980) wrote that teparies were planted in Sonora as early as the 1760's and, it is likely that the prehistoric inhabitants of the area also cultivated them. Although a number of authors have reported the cultivation of teparies in Sonora during the twentieth century (c.f. Castetter and Underhill, 1935; Nabhan and Felger, 1978; Sheridan and Nabhan, 1978; Pennington, 1980), little is known of present day techniques and uses for this native crop in the Sonoran region.

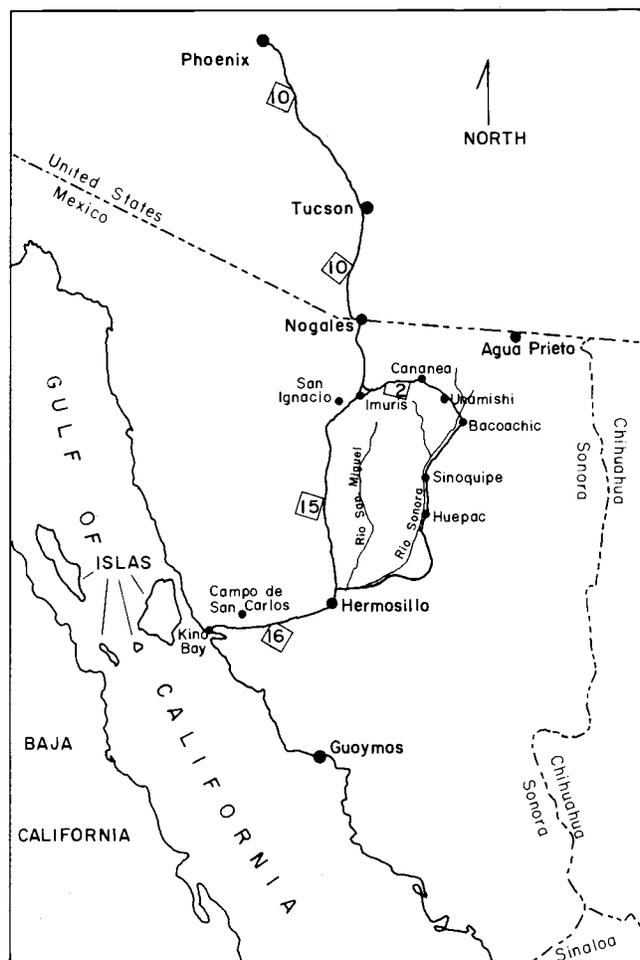
In May 1981, we visited Sonora, Mexico, to investigate the distribution and use of teparies in the Rio Sonora Valley. The specific project goals were: to locate areas where teparies are grown; to ascertain when and how they are planted and harvested, and by whom; to obtain information on the irrigation and fertilizer needs of the crop, and on pests and diseases; to determine if grown for domestic or commercial reasons; and to enquire the use of teparies, and the preference for them in relation to other beans.

We crossed the international border at Nogales and headed south along Highway 15, then east on Highway 2, then south through the headwaters of the Rio Sonora Valley system to Hermosillo, and then west on Highway 16 towards Kino Bay.

In Sonora, tepary localities were found by asking inhabitants and shop keepers if they knew anyone in the area who grew or sold tepary beans. When directed to growers or sellers, we would contact them, introduce ourselves, explain our study interests, and ask if we might obtain information about their tepary cultivation. In all cases, the persons contacted were friendly and very cooperative. The female project member was especially helpful when asking information of women in the absence of men.

The locations for our enquiries are listed in Table 1, which also presents the usual number of crops grown a year, the time of tepary planting and harvesting, and the color of the beans planted. Most farmers planted white teparies, and two grew both white and brown types. Many of the samples of white teparies in Sonora were mixtures of types which might include seeds with cotyledons that stayed green, or a few seeds with brown, grey or black seed coat.

Areas planted to tepary in Mexico varied from a few rows to several hectares (Table 2), but the native farmers never planted more than half a hectare. We saw only one spring planting of teparies other than at the large farm in San Carlos, Sonora. Little rain fell in winter, 1981, which accounted for the lack of most spring crops. The small spring planting at Sinoquipe, Son. used water from the adjacent river via a canal system. Plants at this location were sown in rows in groups of 2-4 seeds. The roots of these tepary plants were nodulated naturally by rhizobia. The use of nitrogen and phosphorus fertilizer varied, with about half of the locations using no fertilizer at all. Higher seed yields appeared from the farm that used



Map showing localities mentioned in the text.

**Table 1.** Locations for information of planting dates, harvest dates and color of tepary beans (*Phaseolus acutifolius*).

Location	Number of Growing Seasons	When Planted	When Harvested	Color of Bean Planted
Cumeral, So.	1	15 Aug. <sup>1</sup>	15 Nov.	white, brown
San Ignacio, So.	2	10-19 Mar.	June	white
Imuris, So. <sup>2</sup>	2	15-20 Aug. Feb. June	Oct.-Nov. Aug. Nov.	white, brown <sup>3</sup>
Unamishi, So. (1) <sup>4</sup>	2	April 1st days	July Aug. Nov.	white
Unamishi, So. (2)	2	April June	Aug. Nov.	white
Bacoachi, So.	2	1st wk. Mar. July	1st wk. July Nov.	white
Sinoquipe, So.	1	mid-Mar.	end of June	white (few grey & black)
Huepac, So.	2	Mar. June	Aug. Nov.	?
Campo de San Carlos, So. (1) <sup>5</sup>	1	1st days	Mar. 1st-2nd wk. June	white
Campo de San Carlos, So. (2)	1	late Feb.- early Mar.	June	white

<sup>1</sup>Depends on when the rain comes.

<sup>2</sup>This information came from the proprietor of an abarrotes (a small general store).

<sup>3</sup>These are the beans he sells; he buys them from Phoenix.

<sup>4</sup>We received information from two separate households in Unamishi.

<sup>5</sup>There were two separate crops on the same farm; one was a commercial crop, the other was an experimental crop (number 2).

fertilizer on the tepary crop, or on previous crops (San Carlos).

The extent of irrigation varied with the amount of the winter and summer rains, but most locations used some irrigation water if it was available (Table 3). Most farmers asked said that teparies would produce a crop with less water than the pinto common bean (*P. vulgaris* L.) land race Garrapata. Some farmers said that teparies grow better in poor sandy soil than common beans. The large farm at San Carlos planted and harvested mechanically: the other smaller farmers planted and harvested by hand. The farm at Huepac was also mechanized, but we do not have information on the size of the farm.

The main tepary pests were grasshoppers (chapulin) and leaf miner, which we saw on crops in the field in Sinoquipe (Table 4). One farmer at Unamishi (1) mentioned infection by rust (chahuistle) and another at Huepac mentioned damage due to honey dew (manteca) produced by insects, including aphids. Only one farmer used an insecticide, and one had tried a herbicide.

The larger farmers at Cumeral, San Ignacio, Huepac and San Carlos grew teparies mostly for sale to merchants, with limited domestic use (Table 5). The smaller farmers grew teparies for domestic use and sold them only when there was a surplus. The price per kilogram varied from 12-25 pesos in Mexico. Teparies are sold in the markets and abarrotes in an area between Phoenix, Hermosillo, and Agua Prieta (Nabhan and Felger, 1978). Also, one of the authors (J.G.W.) had previously bought teparies in abarrotes (grocery stores) in towns in Sonora, and in the central market and supermarkets in Hermosillo. Our informant in Campo de San Carlos said he

**Table 2.** Amount of land planted to tepary, estimates of amount sown and harvested and fertilizer use.

Location	How Much Land Planted	Seed Planted	Seed Harvested	Fertilizer
Cumeral, So.	.5 ha	100 k	1000 k	200 k/ha urea and guano
San Ignacio, So.	.5 ha	20 k	450 k	Foliar urea, and triple de 17 (17N: 17P: 17K)
Unamishi, So. (1)	?	15 k	500 k	urea, phosphorus when money is available
Unamishi, So. (2)	?	3-6 k	200 k	?
Bacoachi, So.	.25-.5 ha	10-20 k	ca. 300 k	no
Sinoquipe, So.	5 rows, each 100 m long	.5 k	6 k	no
Huepac, So.	.25 ha	1 k	60-80 k	urea 25 k/ha phosphorus 8 k/ha
Campo de San Carlos, So. (1)	4-5 ha	50 k/ha	1500 k/ha	no
Campo de San Carlos, So. (2)	?	?	?	no

grew teparies for sale to markets in Hermosillo. There is therefore, a small but specialized market for teparies, and there is the possibility of some international trade in this minor native crop.

In Sonora, teparies are eaten in stews (caldo) broths and soups (cosido). Only one location mentioned eating boiled teparies as is, or mashing them for refried beans. The constitution of the caldo was remarkably similar in most locations (Table 5). Of those asked, all locations reported the tepary as having a distinct smell and taste, though not an objectionable one, compared to that of common beans. While the local pinto beans (garrapata) were eaten three times daily in most places as refried beans, the tepary was eaten once weekly to once monthly at most (this includes the location where tepary use was entirely domestic). It is very interesting that the tepary is at the bottom of each bean preference list of the different locations. Two or three cultivars of common bean were always placed ahead of tepary beans, even though the ranking of the cultivars differed. The most preferred bean was the local garrapata pinto, which is distinguishable from those grown in the U.S. The yellow amarillo cv. was usually the second preference. At San Ignacio, the yorimuni or black eyed pea (*Vigna unguiculata*) introduced by the Spanish, eaten as a green bean, was preferred above the tepary. A future question might be why the least preferred bean in the area studied was grown at all. Most of the locations in Sonora were aware that the tepary is a very old bean, and that it was connected with the prehistoric inhabitants of the area.

This preliminary investigation provides us with previously unreported information about tepary cultivation in Sonora. The survey results also give us a base upon which we can ask more detailed questions concerning such categories as the yield of teparies and the relationship to irrigation and fertilizer use. We may also collect more information about soils, insect pests, diseases, use



*Tepary planting at Campo de San Carlos, Sonora. May 1981.*



*Tepary planting at Sinoquipe, Sonora, May 1981.*



Tepary

*White and brown tepary beans.*



*Tepary plant at Sinoquipe, Sonora. May 1981.*

**Table 3.** Irrigation practices of tepary crop, soil characteristics and planting and harvesting information.

Location	Irrigation	Soil Information	Mechanized or Manual Labor
Cumeral, So.	depends on rain, if normal, then each 10-12 days; if low, then each 4-6 days	River bottom sandy loam	manual
San Ignacio, So.	irrigates before planting then 8-10 days later then each 8-20 days 8 hrs. each time	tepary grows better in sandy soil; in good soil big plants grow, but with low yield, in sandy soil small plants, high yield	manual
Unamishi, So. (1)	uses river water	?	manual
Unamishi, So. (2)	?	?	manual
Bacoachi, So.	depends entirely on rainfall; there are two rainy seasons: June-Sept., Nov.-Jan.	tepary will grow in sandy soil, garrapata will not	manual
Sinoquipe, So.	1 irrigation each wk. for 15 min.	sandy loam near river	manual
Huepac, So.	5 times Mar.-June 4 times Aug.-Nov. 1 hr. each time	?	mechanized
Campo de San Carlos, So. (1)	dry plant, irrigate up then each 30 days twice only for season	?	mechanized
Campo de San Carlos, So. (2)	a small field had received overflow irrigation from adjacent property accidentally, property owner decided to experiment and planted seed in the wet ground, no other irrigation was given; plants produced pods	?	mechanized

**Table 4.** Incidence of pests, diseases and weeds on tepary crops.

Location	Pest	Disease	Insecticide	Herbicide
Cumeral, So.	no	?	no	?
San Ignacio, So.	insects	?	lannate	?
Unamishi, So. (1)	langasta chapulin (grass-hopper)	chahuistle (rust)	?	?
Unamishi, So. (2)	?	?	?	?
Bacoachi, So.	leaf hopper chapulin	?	?	?
Sinoquipe, So.	leaf miner	serious weed problems (nutsedge)	?	?
Huepac, So.	chapulin	manteca (honey dew)	?	?
Campo de San Carlos, So. (1)	?	?	no	no
Campo de San Carlos, So. (2)	?	?	no	no

**Table 5.** Domestic and commercial use of tepary beans, method of cooking and preference in relation to other cultivars of beans grown.

Location	Domestic Use	Commercial Use	How Cooked	Order of Bean Preference
Cumeral, So.	yes	yes, 15 p/k	cook 25 min. then eat as is or mash	garrapata cutamundi tepary
San Ignacio, So.	limited	yes, sells in Magdalena, Santa Ana, Hermosillo, Nogales	in caldo or cosido, Mexican soup	garrapata amarillo yorimuni tepary
Unamishi, So. (1)	limited	yes, sells 5 p/k	caldo with meat and vegetables	garrapata amarillo various others tepary at bottom of list
Unamishi, So. (2)	almost entirely	if there is a surplus, 12 p/k	caldito with many vegetables	garrapata amarillo tepary
Bacoachi, So.	yes	if there is a surplus, 14 p/k	caldo, all green vegetables, bone, meat, garbanzo beans; cook 3 hrs.	garrapata amarillo tepary
Sinoquipe, So.	entirely	no	caldo with bone and meat	amarillo tepary
Huepac, So.	limited	yes, 12/13 p/k	caldo with onion, green chile, meat, bone, cilantro, cook 2 hrs.	amarillo garrapata tepary
Costa de San Carlos, So. (1)	limited	yes	caldo	?
Costa de San Carlos, So. (2)	limited	?	caldo	?

of insecticides and herbicides and other cultural practices. We need to know more about the planting and harvesting of teparies in relation to frost, for some adult teparies appear to show frost tolerance. It may also prove valuable to gather more information on cultural preferences and traditions, and why teparies continue to be grown. We did not ascertain whether use of teparies has a medicinal or religious significance. This type of data may help in improving the success of extending culture of teparies to other semi-arid areas of the world.

#### References

- Castetter, E.F. and R.M. Underhill. 1935. The ethnobiology of the Papago Indians (Ethnobiological Studies in the American Southwest 11). *Univ. New Mexico Bull., Biological Series*. Albuquerque.
- Nabhan, G.P. and R.S. Felger. 1978. Teparies in southwestern North America: A biogeographical and ethnohistorical study of *Phaseolus acutifolius*. *Econ. Bot.* 32: 2-19.
- Nentvig, J. 1980. *Rudo Ensayo*. Translated by Alberto Francisco Prudean and Robert R. Rasmussen. University of Arizona Press, Tucson.
- Pennington, Campbell W. 1980. *The Pima Bajo of Central Sonora, Mexico*. Vol. I. *The material culture*. University of Utah Press, Salt Lake City.
- Sheridan, T.E. and G.P. Nabhan. 1978. Living with a river: Traditional farmers of the Rio San Miguel. *Arizona Hist.* Vol. 19. Arizona Historical Society, Tucson.