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About the Institute

The Hunt Institute for Botanical Documentation, a research division of Carnegie Mellon University, specializes in the history of botany and all aspects of plant science and serves the international scientific community through research and documentation. To this end, the Institute acquires and maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other modes of information service. The Institute meets the reference needs of botanists, biologists, historians, conservationists, librarians, bibliographers and the public at large, especially those concerned with any aspect of the North American flora.

Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.

Cacao, April 6, 1906. / 90

Maize.

According to Mr. Nitsch of Panzos there is a specially large kind of corn grown at Coban under the name cam-bob - a word or expression for which he does not know any other meaning.

The large corn grown by the Indians in the level country about Panzosis called simply saqui-hal, or "white corn."

Maize.

A lepidoperous (?) larva was doing very serious damage in the terminal buds of a field of corn near Secoyote. This injury is very general, Mr. Walter Champney informed us, in corn planted in the dry season. After the rains begin the damage ceases. Possibly the larvae are drowned out by the water which is held by the rolled in leaves of a young corn plant.

Judged by U. S. Standards the "dry" season of Alta Vera Paz would be emply wet enough for corn, if not too wet. Planting has generally to be deferred till the end of the dry season because milps are not generally burned before that time, but the influence of such a parasite is thus in favor of later planting and might well be worth taking into account.

If the water were detrimental to the insect larva the holding of much water would constitute a bionomic character of corn varieties for this region.

Trece Aguas, April 23, 1906.

Maize.

1- 260

Another department of corn lore of the Indians is the special names given to different plantings of corn in different months of the year. Three are usually distinguished.

Maize. Hames of corn crops.

Sak-li-gua - pl Oct.-Nov.

Hun chil cal "white Corn" pl. Jan. Feb. "first planting"

Cat caal Apr.-(takes 4 1/2-5 months)
"Burnt milpa"
Mojon caal May-June
"Later milpa"

Behind -Past milps Planted only in binuagencies Planting other than cat call require 5 months.

Sak-li-qua only in valleys, not on hills; can not be cleared by burning because of rainy season.

Hun chil caal - Burned if opportunity offers. Sometimes very successful at higher elevations. -- 4,000 feet, and often the best milps of the year.

Cat caal. Principal milpa at lower elevations, as at Trace Aguas.

See girls with.

Mryne agr.

Trece Aguas, May 1, 1906. fr 314

Cheh lich planted from 1,500 upward.

Sabeli hal while torm work 1,500 ft; (ft. re) a blockCanceal - 3,000 feet and upward (yellow com) very

large Coban, Tactic. Corn ripens commonly in 4 months, but has to be left out till it gets thoroughly dry; otherwise it decays when stored. About Coban corn broken down by the women to let the rain run off, but this is not done about Trece Aguas. Corn in Texas turns down when mature, according to Mr. Ross.

Cacao (Maize)

pr 317

A diversity similar to that of the cacao is found in the corn variety called chektitch (leech). It is white, yellow or purple, with much diversity also in the shape of the ears, but the quality of the kernels themselves is very uniform. It would probably be described as a semi-dent variety. Other type of Indian corn show no such diversity, but are like U.S. varieties.

Maize.

It would be worth while to collect all recorded information regarding maize in Central America, of a bionomic character, habits of growth, uses, etc. If given an ethnological character it might be called "Maize Lore of Central America," and could be made the basis of arrangement of much knowledge regarding the native peoples and their agriculture. With such a collection of information as a basis much more information could be collected and preserved from extinction.

Maize.

Two more bionomic characters of corn were detected at Rabinal. The young corn is from six to ten inches high; little or no rain has fallen since it was planted, but theyoung corn is not dead or dying as might be expected. Hearly every loaf is still green to the tip. This notable resistance to drought is to be explained, partly at lea t, to the fact that the leaves promptly curl inward as soon as the sun strikes them in the morning. Where the corn is shaded by a hedge or tree it remains open, but as soon as the direct light comes it curls up closely, so that the young plants look more like onions than like corn, as one member of the party remarked. The resemblance to onions is increased by a second drought resisting character, the presence on the under side of the leaves of a distinct layer of bloom or pruinosity, like that which covers the surface of some varieties of plums, grapes and other fruits. This material no acoust protects the under surface of the leaves from the sun and reduces the amount of moisture which is necessary to keep them from wilting.

390-9

Zacualps-Cheche, May 12, 1906.

Maize.

ught in market of La

A large hard variety of corn bought in market of La Zacualpa called <u>Maize blance</u> and <u>Maiz pinto</u>. Grainswhite, purple or yellow.

Zacual pa-Chiche, May 18, 1906.

Maise. (Superficial culture)

On the highlands as about Sacualpa maise is mostly grown in the vegas at the bottoms of the valleys, a few feet above the water level or on somewhat higher slopes where the water leaches out. Springy places are not infrequent in some localities.

spurs or crests, and quite without reference to the ground moisture. Dependence is placed entirely in the water stored in the corn-hills which are here made very high. Even the seed is not planted below the surface, but on an inch or so of earth taken off an old hill. Two or three inches more earth are then piled on. The soil is so dry that the corn camprobably remain in it for a long time uninjured and germinate whenever enough rain comes to wet the little mound. The old hill is held over to the new during cultivation, the whole process not going below the general surface level. Examination of the roots of the old corn shows that none of them run down into the soil proper which with the protection of the hill may remain dry. The roots extend out sidewise to get the moisture of the loose earth of the hill.

The corn is often planted from two to four inches above the general level of the soil, and about two inches below the surface, the dry granular soil making this depth practicable.

Summer season probab dividy, prepart and leaves

9-9-2 11 Chiche, May 14, 1906. p. 397

Maize.

The photo following the above series shows a sample of corn-hills as commonly built in this country. The present instance has additional interest in the fact that the corn was apparently planted on grass land without plowing, but by building the sods up around the corn, which was planted above the sod, some of the grass at the original level showing at the sides of the hills.

400-12

Quiché. May 14. 1906.

Maise Mais de canajal (that is, yellow maise) p. 400

Very large, grown in the vicinity of Chimaltenange finca Rosario near San Martin Jilotepec. Said also tobe a variety with very short and thick ears in the lowlands. Sown now (in May) and harvested in September. The large long variety is grown in the cold land the other in the temperate land.

40x 13

Quiche, May 14, 1906.

p. 401

Maise.

The custom in this region is to plant 4 or 5 grains in a hill. The very large yellow meize of Chimaltenango is said to produce often two ears and sometimes more: five or six ears to the hill is the expectation. The yield claimed amounted to about 50 bushels per acre.

70+ 14 Quiché, May 14, 1906.

Maize.

A man was watched planting corn near Quiche this morning, May 14. The earth appeared perfectly dry. Small mounds about three inches high were built of earth hoed from an old hill, 4 or 5 kernels were dropped on this and covered with a little more earth. There had been no rain thus far in this vicinity this season, but this evening it has rained heavily for about two hours. The corn is nearly all planted. The advantage of planting before the rain begins is very obvious from the standpoint of the labor necessary, for the dry earth can be handled easily. If the rain should continue daily planting might become very difficult, if not impossible. Pain makes the land extremely sticky and tenacious, and the condition of the soil might be very different for plantings made after the rains begin.

Quiché. May 14, 1906.

Bionomic (Maize)

Guatemala affords excellent if not unequalled opportunities for the study of the bionomic characters of the corn plant, with the prospect of enabling us to learn much of interest and practical value for the United States. It would be rash to estimate the number of local varieties of corn with different qualities and adaptations to different conditions of growth, from the hot and humid coast belts to the cold and dry highlands of the interior. The number of these local sorts with appreciable differences is probably not less than a hundred, and may reach several hundreds, if adaptations to diverse conditions of soil and climate be reckaned as characters distinguishing the various kinds. In the present paper it will be practicable to give only a few brief indications of the nature and extent of the varietal differences, and of the possible significance of some of them for the United States and the tropical islands.

408 16

Quiche, May 14, 1906,

Corn. "Kameneftx"

p.408

White corn or yellow, but apparently alike in other respects, same size, shape &c, sold in market of Quiche.

419 Quiche, May 15, 1906.

Maize.

The planting of corn was continued today, after the heavy rain of last night, wherever the work had not already been finished. In every case noted one man was working alone. The system of changing work and planting a whole milps in one day as in Alta Vera Paz seems not to be in use. Planting seemed considerably more difficult because the earth stuck to the hoe, but the ground in the fields is evidently not so tenacious as in the paths.

One of the results of this method of planting corn on little hills of earth is that a little cavity is formed at the side of the new hill, between it and what remains of the old hill. This hollow holds a little pool of water, which soaks into the new hill and insures its being thoroughly moistened.

496 Totonicapan, May 16, 1906.

Maize.

p.420

Other types of corn cultivation were seen between Quiche and Totenicapan. Steep hillsides are trenched and ridged across the slopes, and the corn planted in two rows one on each side of the ridge. The very steepest slopes are regularly terraced, the terraces being about two feet wide, but these seem not to be planted in corn; perhaps they are for wheat.

428429 / Quetzaltenango, May 18, 1906.

Mai ze.

The transverse ridges on which corn is planted along both sides as noted in another place are afterward hoed up into hills of the usual form. The object attained by this method of planting seems to be to get the corn in as deeply as possible and at the same time make it possible to handle all the earth about after the corn is planted.

In the very loose volcanic soil about Quelzaltenango the other extreme of the superficial hill system of the Joyabaj-Chiche region is reached, for at Quetzaltenango the corn is planted in furrows between considerable ridges, to get it as far into the ground as possible, the dependence here being placed on the moisture which enters the soil as a whole instead of merely upon that which can be caught by the little hills of broken earth.

442 20

Quesaltenango, May 18, 1906.

Mai ze.

p. 442

Bundles of the fresh leaves of young maize are brought in considerable quantities to the markets of Totonicapan and Quegaltenango. In answer to questions it was learned that they are used to wrap tamales in. Doubtless they give a pleasant flavor to the enclosed food boiled with them.

142 21

Quezaltenango, May 18, 1906.

Mai ze.

The long husks of the San Martin corn of which samples were secured at Quiche have a special value for wrapping tamales in. They are brought to Quiche in bundles and sold for that purpose. This is something similar to the Missouri (?) variety of corn which is grown especially for the large hard cobs, for making corncob pipes.

449 2 2 Quezaltenango, May 20, 1906.

Maize.

The plowing and preparation of the land by modern agricultural machinery has been tried in the vicinity of Quesaltenango with results greatly surpassing those of cultivations by native methods close by. Much of the corn land, especially of the region between Joyabaj and Quiche is level enough to plow, and some of it is doubtless treated in this way by wooden native plows as in the region of Rabinal.

The idea common among people newly arrived in tropical countries, that great things are to be achieved by the introduction of plowing and other agricultural methods from temperate regions. is often very much in error on account of the very great diversity of conditions, on the other hand, there is every probability that on many of these comparatively level corn-lands of the interior plateau of Guatemala the use of modern plows and other agricultural implements for preparing the land would be found very advantageous. This does not mean that all the methods employed in the United States could be introduced without discretion. Differences of condition would still demand differences of methods, as in different parts of the United States. Good judgment, enlightened by intelligent experimentation would be necessary, probably, to ascertain which methods would yield the best results in the many different localities to be found in so varied a country as Guatemala. People of intelligence willing to use their time and capital in such agricultural pioneering are rare in any country. The cheapness of the native Indian labor and the immense difficulty of training it in the use of new methods are also large obstacles in the way of undertaking anything new in agricultural lines.

Quesaltenango, May 20, 1906.

Maize.

450 lbs to cureds of 25 verss. With the Lulyatte.

Pol =

Diente de ajo: obispo

\$1006

Diente de ajo. Every plant bears one and usually more than one ear, sometimes 5 to 8; harvest very large. Very early crop in ed five months. Planted mix with mais negro and zapalote blanco, two grains of each in each hill, to increase the yield. Ears small, but very rich in corn. Other kinds are also planted mixed to increase the yield. Of Mexican origin. Sown from March to early in May. Harvest also in November.

por)

Zapalote amarillo tortilles and tamales; no special uses.

None of these kinds of corn planted on the coast.

Dente de ajo, zapalote amarillo & blanco & the black corn

can be planted in poor land, but hetter in good, when they get from it 5 ears to a stalk. Pol usually as 2 or 3 ears to a stalk, usually about 2; six or eight stalks planted to hill 1 1/2 metres apart.

Black corn in poor land 1 1/2 quintels on a cuerda of 25 warss. Planted only on poor land, the black corn.

Hilling called calzar putting shoes on; done to keep the wind from blowing it down. Roots would be to shallow to give good crop. Ridges are made between two rows in order to be able to make the hills higher.

Quesaltenango, May 20, 1906.

Maize.

450 lbs to cureda of 25 veras. With it Dullyatte.

Pol =

Diente de ajo:obispo Zapalote amarillo:ixim acan

Zapal blanco sac ixim

Sal por

mais negro

tastal (dent corn)

Sac . Pl. Mch.

re swawch-

(2 ears mixed tastal & Sal por)

maisena

Has to be in rich earth, planted in March, harvested first of Movember.

to por Tamales de carne, and for meal, to make dulces etc, but not for tortillas also used to make bread. Samples said to be very poor; grows very large ears. Needs good land, the best.

Zapalote amarillo, tortilles and tamales; no special uses.

None of these kinds of corn planted on the coast.

Dente de ajo, zapalote amarillo & blanco & the black corn

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Maj ze.

According to information at Quezaltenango it is customary on the highlands seen from road between Joyabaj and Quiche to plant for two or three years, then let the grass and weeds grow, and then bury them in the ground.

In Quiche they do not have the starch corn (sal por) nor the zapalote nor the dento de ajo. Last year corn at 80 peso now scarcely 40 -- a funaga (150 lbs) Corn planted on same land about Quezaltenango every year.

1/ zapalote. Nahwall toppatt = dovur

Quezaltenango, May 22, 1906.

12.466

Maize.

It may be doubted whether the corn varieties of these high plateaus of Guatemala are likely to prove truly drought-resistant, or as much so as those of the somewhat lower districts farther to the east. These very porcus volcanic soils while apparently very dry and mealy probably hold moisture for a considerable period after they have once been wet, and may never subject the corn to the severe conditions of drought which sometimes in the hotter districts lower down, such as the valleys of Rabinal and Salama.

The Mexican table-lands with more deficient rainfall will doubtless show better varieties with respect to drought-resistance in the direct sense of ability to grow with little water. As already seen, however, the custom of planting corn at the end of the dry season has given extensive training in drought-resistance to some of the Guatemalan varieties.

4 7 7 Agua Caliento, May 25, 1906.

p. 477

Maize.

At Agua Caliente are several fields of corn already nearly old enough to show tassels. This part of the country is evidently more moist or it gets earlier rains than the Quezaltenango district, or the regions to the east. The corn between Agua Caliente and Huehuetenango is mostly three or four feet high. At Quiche and the region to the east it was just being planted or was only a few inches high, except in rare cases. About Quezaltenango it was from 2 to 6 inches high, as a rule. In this district it is from two to five feet, or more. The other features of the country indicate somewhat greater moisture, though perhaps only earlier rains, for the entire country is open and shows every indication of being subject to severe drought.

7772 27 Chiantla, May 26, 1906.

Maize.

At Chiantle was seen a yellow corn with large cobs, moderate ly short and conical. Call only mais de tiena fria according to our informant. Will not grow at all at Chiantla, but thrives two leagues farther up in the mountains. Planted in February, ripens in November.

To the north of Chiantla the country is crossed in an east and west direction by a range of high mountains, evidently not volcanic or with no recent volcances at least. The slopes are cultivated clear to the top, which is over 12,000 ft where the road crosses, according to local information.

338 28

Margare V. Ogue

Candelaria, June 3, 1906.

12.538

is to be found another type of corn culture, the crop being planted among the bushes which are left after fire has run through. Sometimes the sticks are all cut down and carried off for fire-wood, but not, apparently, for the venefit of the crop. The soil is everywhere very rocky, and the soil where it exists fine and loose. Planting is done with a stick, as in Alta Vera Paz. The chief difference seems to lie in the fact that here the climate is so extremely dry that thevegetation will burn off without being cut down. A large proportion of the plants are probably perennials with underground roots or rootstocks from which they can grow out again when the rain comes, but the corn being planted near the surface doubtless get the benefit of the rain in advance of the other plants and is able to mature a crop before being smothered by the other vegetation.

In a year or two the same place may have enough growth to burn over again, and permit another planting with com. The ultimate fate of the soil under this system is to be all washed away, leaving the rocks bare, the present condition of much of this region. In some places it appears as thoughthe rocks themselves were disintegriting very rapidly, perhaps as a result of the burning. This might replenish the soil sufficiently to make this rude system of culture a permanent one.

The normal system of cut and burnt milpas like that of Alta Vera Paz reappears in the mountains above Jacaltenango, and is doubtless practiced in much of the humid region from there eastward.

This system of planting corn in the bush without cutting represents the farthest reduction or most rudimentary beginning

Maise.

of cultural methods. Should be canvassed in the paper on agriculture and fire. It enables the land to be cleared sufficiently for agricultural purposes by fire alone under these conditions of soil and climate.

perennial grass very closely like corn in appearance in the young stages of growth, growing in these same areas of burned land. It is now sprouting out anew after the burning, before the planting of the corn. If the corn plant were originally native in such a region as this it is easy to understand how its culture might be undertaken by a primitive people. The only agricultural operations necessary would be to plant and to harvest, no clearing, plowing or cultivation being necessary.

Selection for salines in cuttivation ings.

Selection for saliness in cuttivation ings.

render and a plant annual, is

render and a plant annual, is

557 30 San Vicente, June 4, 1906.

Mai ze.

The fines of Juncana about a day's journey to the south of Comitan is said to produce the largest corn in Mexico. Exhibited at the worlds fairs and in Museum at Mexico. Said to be a native variety in that particular region. Does not yield well when taken to other places. The idea of persevering in the face of a bad result of the first year or two could not be expected to occur to primitive people, but should not now deter us from making at least an experiment to test the powers of adaptability of the corn varieties. It might require five years or more to complete such adaptations, but when once made they might be highly advantageous. The difficulty is seldom that the stalks refuse to grow in the new places, but that the crop is small. This may mean merely that the additional energy of growth needs only to be tamed somewhat to put in to useful work

500-31

San Vicente, June 4, 1906.

Maize.

p. 160

4 kinds at San Vicente. Mais amarillo, blanco, tejar, teg-ua (with ears very thick-Corn of hot country. The tejor rariety has very small ears. All planted here in June; amarillo and tejor are early, the harvest end of August, the others in December. Blanco considered best for tortillas, amarillo best for chocolate and for the animals. Tejor produces fine flowers; is very white; soft; cob very small. Very flat kerneled with a broad channel. Very unlike any Guatemalan corn.

Maize.

The corn at Las Hoyas is of the same general type as that of Juncana, but seems to be all yellow, while that at Juncana is largely white. The owner of the Juncana finea assured us that all the corn on hand at present was extremely small. The ears are still immense, however, though not equal in length to those from Chimaltenango, found at Quiche.

The corn in this part of the country suffers excessively from a small lepidopterous insect much resembling the familiar house moth of the United States. Corn weevils which are so abundant in Guatemala were not seen. When a pile of corn is disturbed the insects rise in clouds and in some places nearly every kernel has suffered. Other than the loss of the part destroyed by the insects the corn is not injured for the natives, by the presence, present or former, of the insects, but for planting it is useless. Probably to secure at least a partial protection against the insects the natives are accustomed to keep their corn in bins which in their houses close about their fires, where the smoke doubtless keeps the pests away. Corn stored in the houses or granaries of the more civilized inhabitants does not have this protection and appears to suffer much worse. If a remembly for this parasite could be suggested it would be much appreciated in this part of the world. Get identification of insects and inquire for remedy from Bureau of Entomology. Question likely to be asked of travellers here.

Mai se.

The land about Juncana where this largest of Mexican varieties of corn is grown, is a black sticky soil much like the adobe or gumbo soil of Texas. It also reaches the hog-wallow condition quite like the Texas prairies. The resemblance extends also to the country at large which for several leagues on both sides of Juncana is nearly level and prairie-like, with Texas landscapes formed of scattered oaks, pines, Brysonima and small Acacias like guisache. Similar flat open country appears to extend for several miles on both sides of the road, so that the region to the south of Comitan might be described as a misplaced part of Texas. Similar conditions are to be found, however, in the Tehuantepec country and northword at places along the Vera Truz and Pacific Mialroad. The Texas prairies thus have their analogues in the far south, no less than the cactus deserts of Arizona or the coniferous forests of California.

Another feature of similarity with Texas is the fact that these level places seem to be formed largely of water-washed gravels, indicating, perhaps, recent deposition. The most accentuated hog-wallows seem to form in places where the black sticky soil over lays gravel. When the black soil cracks the surface water falling in the first rains runs down these cracks into the gravel in large quantities, carrying down much fine material from the surface, and doubtless leaving something of a depression at the place where the crack had been. This would tend to collect the colloidal material and be likely to induce the formation of another large crack in the same place in the next dry season.

Maize.

The proprietor of the Finca Juncana where the very large corn is raised, six leagues south of Comiten is SD Dr Christian Carascoza. Other members of the same family are to be found in Comitan.

36 L'Aurora, June 6, 1906.

Maize.

The large corn from the Department of Chimaltenango was a cold country variety grown at high altitudes that of Juncana is already adapted to much lower elevations, to a probably much drier atmosphere, and to a soil which in its general appearance and behavior is notably similar to much of the land of southern Texas where it is very desirable that new varieties of corn shall be introduced more suited to the natural conditions than those brought from the norther states.

Maize.

A new way of using corn-boiling or roasting the very young ears and eating them cob and all or even husks and all, when roasted.--about as thick as the finger or less. Called jilote at this stage; translated by Spaniards as ijo de clote, the roastingear size being name blote.

Another method of using corn is to drink it in the form of what is called pisoli. The corn after being prepared as though for tortillas is made up into balls or cakes and dried. In this form it is often carried on journeys by the Indians being the form most easily prepared for food.

I jilote is the nahuath Xiloth, that signifies a tender but always exitle come ar " olote is oloth, come col elote " eloth, com ear :

2) from nahuath: posolath, a drink mare

of takes um

Maize. (Mexico)

The difference in planting seasons often betweenplaces only a few miles apart will greatly complicate the work of gaining a thorough knowledge of the maize varieties of this region.

Thus at Comitan the regular corn planting season is the first half of June, the work being everywhere in progress at the time of our visit. About Bajucu, however, and between Bajucu and Mendoza, only a day's ride from Comitan, the corn was nearly all in the tassel, and roasting-ears are the order of the day. In this region the rainy season is well begun, but another day farther along, as at Bancho Mateo and Occaingo the rains have not yet commenced. The dead leaves and surface soil are quite dry though the vegetation has not suffered, this being a much more humid region than farther to the west.

Majze.

To make posol the corn is cooked with lime to take the skin off just as for making tortillas. The material is sometimes flavored with cacao and cinnamon and then resembles the drink made from toasted corn.

Haize.

Custom not to cover the kernels about Lumija; Mr. Markley found that seed rotted when covered, especially in clay soils.