

6. CONCLUSIONS AND RECOMMENDATIONS

6.1. SOILS

Module 1 Laguna Encantada

Conclusions.- As a conclusion, for the soils of Laguna Encantada it can be said that they are soils whose pH goes from moderately acid to neutral, with low contents of organic matter and nitrogen, although potassium reports high values, existing and unbalance with the other changeable bases for which the absorption of potassium can be limited. There are no salinity problems.

In the same way, the cationic exchange capacity is average to low, which permits the determination that the fertility level in these soils is in the same sense, the texture of these soils is of a loam or sandy loam type. From their origin the soil is volcanic and two taxonomic units were identified: *Umbric Andosol* and *Eutric Andosol*. Phases were not identified. The geomorphology corresponds to volcanic cone slopes.

Recommendations.- The addition of crop residues and organic fertilizers is recommended to improve the natural content of nitrogen and many more qualities in its physical and chemical qualities, among them, the cationic exchange capacity.

The fertilization with potassium is recommended, light applications of lime and gypsum are suggested to increase the content of calcium.

Module 2 Tlacojalpan-Ambrosio

Conclusions.- It can be said that the soils of this module are of an alluvial origin, of a loamy clay lime, clay and loamy lime texture, its pH is light to moderately basic, with average levels of organic matter and a phosphorous deficiency. The cationic exchange capacity presents very high values due to the high content of clay. It does not present salinity problems.

Due to the alluvial sediments two taxonomic units were identified: *Eutric Fluvisol* and *Endostagnic Eutric Fluvisol*. Phases were not identified. Puddling is persistent during the rainy season because of microrelief.

Recommendations.- The addition of organic matter is recommended to improve the apparent density of the ground, besides to improve the drainage, ventilation and the negative effect of calcium. It is recommended to add granulated phosphorus to avoid its retention, also to add potassium to balance its content with respect to calcium and magnesium.

It is recommended to make leveling of grounds to correct microrelief and to construct drains.

Module 3 Tesechoacán-Curazao

Conclusions.- As a conclusion, it is possible to be said that the grounds of this I module are of alluvial origin, of loamy clay lime and loamy lime texture, with pH of neutral to slightly acid or basic, they have low contents of organic matter and nitrogen, did not detect phosphorus. The capacity of cationic interchange is of average to high, indicating its level of fertility. These grounds do not have salinity problems and the acidity in acid samples is unnoticeable.

The taxonomic units identified are: *Stagnic Eutric Fluvisol*, *Stagnic Distric Fluvisol* and *Sandy Distric Fluvisol*. A small area was identified as an inundic phase in the Tesechoacan submodule.

Recommendations.- The addition of organic matter is recommended to improve the apparent density of the ground, besides to improve the drainage, ventilation and the negative effect of calcium. It is recommended to add granulated phosphorus to avoid its retention, also to add potassium to balance his content with respect to calcium and magnesium.

It is recommended to make leveling of grounds to correct microrelief and to construct drains to avoid puddling.

Module 4 Los Naranjos

Conclusions.- The grounds of the Naranjos module are grounds of alluvial origin of sandy loam and clay loam texture, with moderately acid pH, low to average contents of organic matter and nitrogen, with potassium deficiency. The cationic capacity of interchange is of average to low reason why its fertility is described as average to low.

The taxonomic units identified are: *Endostagnic Distric Fluvisol* and *Mollic Fluvisol*. Phases were not identified.

Recommendations.- The addition of organic matter is recommended to improve the apparent density of the ground, besides to improve the drainage, ventilation. It is recommended to add granulated phosphorus to avoid its retention, also to add potassium to balance its content. The addition of light whitewash is recommended to increase ground pH, with values from 4 to 5.

It is recommended to make leveling of grounds to correct microrelief and to construct drains.

6. 2. ENVIRONMENT AND AGRICULTURE

As far as the present use of the ground in the 4 studied modules, it is possible to be affirmed that in the totality of the area the ground use is farming, emphasizing as a main crop that of the sugar cane, the rest of the crops like maize, rice and tobacco

do not have significant comparison in respect to first. Areas with original vegetation of the tropical forest were not identified.

In the 4 studied modules the warm climate of group A predominates; every month of the year it rains, although the lowest precipitation is registered in the module of Los Naranjos; the thermal oscillation does not display great variations and it is never lower than 18°C.

As far as geology and geomorphology 2 regions are distinguished: The first that is the one of Laguna Encantada of volcanic origin with slopes where the volcanic cones dominate; Second that integrates the three remaining modules of Tlacojalpan-Ambrosio, Tesechoacán-Curazao and Naranjos, whose geoform corresponds to plain and by their origin are grounds formed by alluvial deposits of the Quaternary.

6.3. WATER

The results of the chemical and bacteriological physical analyses of all the evaluated water sources, allow to conclude that its quality is apt for irrigation, including many of these sources are used for urban provision. Lack to construct or to finish constructing the systems of irrigation in most of the studied submodules.

As a recommendation and once the different systems from irrigation work, it will be necessary to determine the regularity and the laminates of specific irrigation for each crop. In the same sense and for the specific case of the submodule of Tesechoacán, it is recommended that the system irrigation changes, of rolled water to irrigation by aspersion.

6.4. SOCIOECONOMIC CONDITIONS OF THE PRODUCERS

As for possession it is possible to be affirmed that most of the producers have title certificates or writings, except in the Ejido Uno of Tesechoacán, which does not have the basic plane of the Secretariat of the Agrarian Reform and the certification process has not begun before the National Agrarian Registry.

In respect to housing, the census allowed to know that most of the producers have the basic municipal services, that its house-room in most of the cases is made of block and metal sheet ceiling, except for counted cases where the wall is of wood.

In general the economy of the producers is dependent of the economic system that operates in the sugar mills, which implies advance payments on harvest and liquidations, and of course the medical service of the social insurance.

The producers do not have either the service of specialized technical assistance and on credit and agricultural insurance.

Most of the producers are older than 40 years, although the members of the families participate in the agricultural activity.

In 3 of the 4 modules of irrigation it was possible to identify natural leaders of the producers, same that are mentioned next:

Tlacojalpan-Ambrosio: Sr. Ángel Máximo e Ing. Fernando Pliego Sánchez

Tesechoacán-Curazao: Sr. Luis Humberto Bonola, Luis Alberto Bonola Díaz y Sr. Vicente López Cruz.

Los Naranjos: Sr. Alejo Francisco Cabrera, Sr. Eulogio Martínez Justo, Sr. Apuleyo Santibáñez Fuentes y Sr. Juan Pacheco.

In the case of Laguna Encantada in which different lands and a great and significant area are deprived of property from Tierra Blanca it was not possible to identify between the producers some natural leader, the opinions on the future of the lands is divided, ground speculation for urban use exists.

6.5. MARKET AND MARKETING

Derivative of the study of commercialization and market, it can be affirmed that agricultural products like vegetables, flowers and fruits, mainly, are to say more than 90%, are concerns in other parts of the country, and including out of it. The previous induces to think still more that the production of vegetable species that replace the mentioned imports means an excellent opportunity to journey towards a profitable agriculture, if these agricultural production systems count in a near future with irrigation systems.

When analyzing the process of commercialization and market of vegetable and fruit products and flowers, a market niche of seasonal opportunity could be identified, that is to say, to produce some of the species demanded in the river basin as they are: tomatillo, Chili and red tomato in the period of droughts, which means in the period of autumn-winter (OI), the previous is because in the Mexican plateau the presence of frosts prevents the production of the mentioned vegetables, the destination of this production, in addition to the local market, can inclusively be the regional and national market.

In order to propose the alternative crops based on the reasonings of explained market and commercialization in the previous paragraphs, the production costs, sale prices and probable gain were analyzed; it was looked for that the proposed species were profitable crops with the goal to favor the quality of life of the producers.

6.6. ALTERNATIVE PRODUCTION SYSTEMS AND TECHNOLOGICAL PACKAGES.

When analyzing the production systems in the 4 modules of irrigation, it can be affirmed that the system with better qualities is Tlacojalpan Ambrosio with 52,2%, followed by Naranjos with 50,8%, Tesechoacán-Curazao with 45% and Laguna Encantada with 43.6%. The improvement of some elements of the production systems studied here, such as for the ground the works of leveling, construction of drains and the incorporation of organic installments, besides to conclude the

construction and operation of all the systems of irrigation will mean that in the short term the percentage above indicated will improve substantially and by consequence the improvement of the quality of life of the involved producers.

The technological packages proposed here, must be taken with much reserve since the fluctuations of the market are very sensible and in any case it is recommended to initiate some of them at pilot level, lack many questions that have to be answered such as period and laminate of irrigation by crop and corresponding submodule, the effects of the works of leveling and construction of drains, the behavior of the different cultivated varieties, the occurrence of plagues and diseases and the adoption of the technological package on the part of the producers, to mention only some questions.

The proposed technological packages are:

- Sugar cane
- Onion
- Cabbage
- Chayote
- Guava
- Maíze
- Mango
- Melon
- Papaya
- Cucumber
- Black pepper
- Watermelon
- Saladette Tomato
- Green Tomato
- Vanilla
- Rambután
- Litchi
- Maracuyá
- Soursop
- Rice
- Jalapeño Chili

In order to integrate the technological packages of the alternative crops, the following script was applied:

- # Common and Scientific name.
- # Production cycle (Annual OI) (Perennial or Semiperennial)
- # Introduction
- # Edaphoclimatic requirements
- # Preparation of the land
- # Density and planting method
- # Varieties
- # Irrigation
- # Fertilization

- ☒ Overgrowth control
- ☒ Plagues
- ☒ Illnesses
- ☒ Harvest
- ☒ Production costs: The gross entrance is related to the production cost to determine the probable gain of the alternative crops.

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8. ANNEX



DATA BASE OF LABORATORY RESULTS OF FIVE VARIABLES ON SOIL FERTILITY IN TWO DEPTH A(30 cm) AND B(30-60 cm) FOR LAGUNA ENCANTADA MODULE

LAGUNA ENCANTADA											
IDUEG	PH		NITROGEN (%)		PHOSPOROUS (ppm)		POTASSIUM (cmol. Kg-1)		ORGANIC MATER(%)		
	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	
11001	5.67	5.96	0.08	0.068	31.77	10.64	1.536	1.485	1.31	0.719	
11002	5.91	6.22	0.07	0.073	21.48	16.49	1.638	0.573	1.154	0.824	
11003	5.56	5.7	0.13	0.145	49.57	19.42	1.695	1.946	2.285	1.56	
11004	5.23	5.4	0.09	0.071	59.84	20.79	1.229	1.946	1.433	0.748	
11005	4.84	5.72	0.14	0.092	66.61	21.95	1.485	1.229	2.152	0.98	
11006	6.5	6.23	0.058	0.042	22.71	11.81	1.487	0.461	0.806	0.447	
11007	5.96	6.11	0.08	0.096	55.88	26.52	1.587	1.382	1.497	1.038	
11008	5.2	5.89	0.198	0.096	35.09	19.9	1.434	1.639	3.045	10.015	
11009	5.68	5.9	0.184	0.07	51.51	16.67	1.536	1.741	2.227	1.108	
11010	5.38	6.05	0.178	0.07	60.64	9.53	1.638	1.587	2.117	1.566	
11011	5.99	6.41	0.178	0.08	17.49	11.59	0.768	0.512	2.32	1.699	
11012	5.24	6.45	0.19	0.09	73.42	18.75	1.126	1.024	2.338	1.897	
11013	6.48	5.62	0.08	0.078	8.01	3.44	1.997	1.485	1.102	0.829	
11014	5.99	6.3	0.11	0.098	65.56	21.27	1.28	1.024	1.317	1.682	
11015	5.59	6.32	0.118	0.05	88.91	24.61	1.894	1.331	1.444	0.899	
11016	5.47	6	0.19	0.18	0	32.3	0	1.536	2.303	2.552	
11017	5.5	6.24	0.15	0.08	78.76	19.35	1.587	1.536	1.885	1.119	
11018	5.19	5.75	0.22	0.03	97.98	54.64	1.331	1.28	2.187	0.51	
11019	5.13	5.9	0.168	0.06	68.54	19.4	1.178	1.229	2.042	0.957	
11020	5.59	5.78	0.24	0.086	27.09	10.62	1.28	1.126	2.564	1.734	
11021	5.9	5.8	0.09	0.06	119.01	34.61	1.536	1.485	1.288	0.928	
11022	5.96	6.05	0.098	0.06	12.3	41.61	1.485	1.536	1.224	0.951	
11023	5.82	5.75	0.16	0.11	100.95	38.69	1.843	1.075	1.717	1.578	
11024	5.72	5.8	0.178	0.1	107.01	37.43	1.536	1.075	1.85	1.572	
11025	4.99	5.76	0.185	0.105	14.26	11.06	1.28	0.922	1.85	1.317	
11026	5.54	6.9	0.105	0.128	27.68	37.53	1.434	1.229	2.204	1.682	
11027	6.15	5.99	0.92	0.078	94.27	55.5	1.485	1.689	1.245	1.038	
11029	5.59	5.9	0.098	0.06	82.2	64.93	1.792	1.536	1.27	0.945	
11030	5.83	5.74	0.135	0.05	61.84	42.5	1.075	1.894	1.421	0.94	
11031	5.9	5.42	0.12	0.06	33.1	21.87	1.126	0.87	1.489	0.951	
11032	5.52	5.5	0.15	0.048	13.47	9.37	0.614	0.717	1.613	0.818	
11033	5.95	5.88	0.11	0.05	29.27	19.07	1.485	1.229	1.398	0.876	
11034	6.13	6.28	0.118	0.04	37.29	12.89	1.843	1.28	1.079	0.638	
11039	5.9	5.83	0.098	0.1	26.04	19.25	1.485	1.178	1.613	1.218	
11040	6.59	7.13	0.048	0.095	29.45	15.61	1.28	0.717	0.98	0.858	
11041	6.45	6.79	0.078	0.056	21.26	9.77	1.705	0.665	1.317	0.712	
11042	6.28	6.91	0.148	0.04	19.32	10.28	1.28	1.28	1.439	0.661	

LAGUNA ENCANTADA											
IDUEG	PH		NITROGEN (%)		PHOSPOROUS (ppm)		POTASSIUM (cmol. Kg-1)		ORGANIC MATER(%)		
	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	
11043	6.01	6.4	0.11	0.04	73.22	9.86	1.638	1.741	1.45	0.679	
11044	6.4	6.53	0.122	0.1	17.78	20.23	1.382	0.819	1.305	1.235	
11046	6.12	6.51	0.76	2.564	0.04	0.2	18.69	18.16	0.76	2.564	
11047	6.91	6.88	0.092	0.058	19.99	12.2	1.587	0.768	0.957	0.777	
11048	6.91	6.9	0.092	0.038	19.17	12.42	1.946	1.024	0.957	0.626	
11049	6.48	6.15	0.13	0.078	24.45	13.79	2.253	0.819	1.276	0.893	
11050	6.67	6.44	0.13	0.068	2.27	8.98	1.894	1.178	1.352	0.818	
11051	6.5	6.92	0.088	0.058	11.65	7.09	1.485	0.563	0.934	6.748	
11052	6.41	7.02	0.087	0.05	12.08	3.03	1.485	0.794	0.916	0.725	
11053	6.88	6.4	0.098	0.098	18.26	1.69	1.229	0.922	1.143	1.177	
11054	5.99	6.43	0.05	0.056	48.59	41.37	1.434	0.922	1.021	0.702	
11055	6.49	6.52	0.04	0.03	38.24	14.04	1.126	0.845	0.94	0.539	
11056	5.78	6.11	0.098	0.045	20.24	15.39	1.28	1.075	1.491	0.789	
11057	6.15	6.07	0.12	0.078	10.3	4.08	1.229	0.717	1.253	1.148	
11058	6.48	6.09	0.08	0.04	33.64	12.46	2.099	0.819	0.916	0.615	
11059	6.22	5.88	0.128	0.09	15.29	5.95	1.126	0.87	1.63	1.235	
11060	5.61	5.74	0.138	0.108	15.04	6.47	1.229	0.845	1.711	1.299	
11061	5.38	6	0.887	0.708	0.081	0.05	25.6	10.92	0.887	0.708	
11063	6.02	5.98	0.165	0.09	8.47	2.43	0.973	0.512	1.775	1.253	
11064	5.86	6	0.068	0.098	30.87	21.07	1.229	1.28	0.992	1.334	
11065	5.84	5.98	0.06	0.05	28.07	17.18	1.382	1.198	0.928	0.748	
11066	6.18	5.55	0.12	0.098	8.08	18.9	0.41	0.819	1.276	1.224	
11067	6.1	5.95	0.058	0.078	28.46	10.93	1.024	0.819	0.916	0.945	
11068	6.31	7.14	0.11	0.03	29.72	9.58	2.096	3.307	1.154	0.522	
11069	5.39	5.98	0.078	0.058	13.83	9.3	0.819	1.485	1.067	0.737	
11070	6.29	6.4	0.07	0.56	13.77	13.11	1.126	0.732	0.963	0.777	
11071	6.97	6.52	0.12	0.102	38.61	33.23	2.659	1.608	1.699	1.543	
11072	6.45	6.54	0.18	0.168	35.23	29.12	1.997	1.946	2.512	2.203	
11074	7.12	7.33	0.077	0.07	16.04	19.47	3.891	2.515	1.288	0.847	
11075	7.13	7.01	0.02	0.061	15.46	6.4	0.768	0.411	0.371	0.568	
11076	6.12	6.61	0.03	0.038	6.98	3.48	1.587	0.872	0.928	0.545	
11077	6.66	7.13	0.038	0.03	1.09	4.13	0.563	0.821	0.713	0.418	
11080	6.12	6.41	0.138	0.098	19.83	15.56	1.894	1.689	1.845	1.195	
11082	6.37	6.52	0.138	0.058	9.32	2.64	2.304	1.638	1.682	0.841	
11083	6.79	7.06	0.088	0.07	9.81	9.13	1.024	0.922	1.2224	1.16	
11084	6.49	6.64	0.14	0.2	64.53	55.07	0.461	0.512	1.879	2.082	
11085	6.15	6.19	0.24	0.105	33.12	20.59	0.819	0.667	3.045	1.468	
11086	6.19	5.99	0.197	0.09	22.53	6.76	0.922	0.416	2.616	1.386	
11087	6.4	6.12	0.275	0.11	36.81	14.64	1.536	0.719	3.146	1.752	
11088	6.27	6.85	0.167	0.098	44.81	37.3	0.768	0.975	2.865	1.584	

LAGUNA ENCANTADA

IDUEG	PH		NITROGEN (%)		PHOSPOROUS (ppm)		POTASSIUM (cmol. Kg-1)		ORGANIC MATER(%)	
	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)
11093	6.12	6.57	0.153	0.05	23.35	11.49	0.87	0.615	2.03	0.713
Media =	6.039102564	6.24153846	0.14962821	0.123230769	34.98334615	18.365	1.94646154	1.496512821	1.542774359	1.278051282
Varianza =	0.259535548	0.21268851	0.02301143	0.087428907	782.4744172	193.238038	11.4712887	5.124306695	0.362451005	1.630426958

DATA BASE OF LABORATORY RESULTS OF FIVE VARIABLES ON SOIL FERTILITY IN TWO DEPTH A(-30 cm) AND B(30-60 cm) FOR TLACOJALPAN-AMBROSIO MODULE

TLACOJALPANI

IDUEG	PH		NITROGEN (%)		PHOSPOROUS (ppm)		POTASSIUM (cmol. Kg-1)		ORGANIC MATER(%)	
	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)
21004	8.06	8.09	0.12	0.09	0	0	0.59	0.34	2.35	1.78
21010	8.19	8.21	0.16	0.98	0	0	0.32	0.3	3.23	1.68
21011	8.03	8.2	0.17	0.09	0	0	0.29	0.22	3.5	1.82
21012	8.18	8.22	0.09	0.08	0	0	0.25	0.2	1.85	1.58
21016	8.21	8.26	0.08	0.08	0	0	0.24	0.24	1.65	1.55
21017	8.12	8.23	0.11	0.1	0	0	0.29	0.25	2.12	1.92
21018	8	7.98	1.01	1.09	0	0	0.3	0.3	1.75	1.88
21019	7.95	7.99	0.15	0.08	0	0	0.3	0.25	2.96	1.68
21020	8.01	8.15	0.11	0.08	0	0	0.3	0.25	2.29	1.61
21021	7.45	7.5	0.14	0.11	0	0	0.25	0.25	2.76	2.22
21023	8.28	8.29	0.1	0.08	0	0	0.25	0.24	1.95	1.51
21024	8.17	8.24	0.12	0.12	0	0	0.25	0.21	2.35	2.32
21025	7.63	8.19	0.11	0.08	0	0	0.33	0.29	2.19	1.51
21026	8.08	8	0.11	0.06	0	0	0.32	0.27	2.19	1.24
21027	8.09	7.96	0.12	0.07	0	0	0.34	0.28	2.35	1.41
21028	8.04	7.98	0.09	0.06	0	0	0.27	0.22	1.82	1.11
21030	8.25	8.34	0.08	0.07	0	0	0.25	0.25	1.61	1.34
21031	8.3	8.3	0.08	0.08	0	0	0.33	0.3	1.55	1.68
21032	8.28	8.39	0.09	0.06	0	0	0.29	0.22	1.75	1.14
21033	8.15	8.22	0.11	0.07	0	0	0.32	0.29	2.29	1.48
21034	8.22	8.23	0.12	0.07	0	0	0.3	0.26	2.42	1.41
21035	8.2	8.2	0.12	0.07	0	0	0.4	0.27	2.45	1.31
21036	8.21	8.28	0.1	0.05	0	0	0.25	0.22	1.95	1.01
21041	8.21	8.31	0.08	0.06	0	0	0.29	0.27	1.55	1.21
21042	8.15	8.21	0.11	0.08	0	0	0.3	0.27	2.25	1.68
21043	8.28	8.31	0.86	0.07	0	0	0.35	0.3	2.62	1.48
21044	8.26	8.39	0.1	0.07	0	0	0.32	0.29	2.08	1.31
21038	8.37	8.49	0.1	0.1	0	0	0.27	0.22	1.98	1.98
Media =	8.120357143	8.18428571	0.16928571	0.146428571	0	0	0.30571429	0.259642857	2.2075	1.566071429
Varianza =	0.038025794	0.03588466	0.04771799	0.063453439	0	0	0.00449947	0.001173942	0.23614537	0.10146918

TLACOJALPAN II										
IDUEG	PH		NITROGEN (%)		PHOSPOROUS (ppm)		POTASSIUM (cmol. Kg-1)		ORGANIC MATER(%)	
	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)
22039	8.3	8.46	0.1	0.5	0	0	0.3	0.25	2.02	1.08
22040	8.33	8.38	0.092	0.064	0	0	0.28	0.37	1.85	1.28
22047	8.26	8.4	0.11	1.11	0	0	0.25	0.22	2.12	1.75
22048	8.41	8.54	0.106	0.087	0	0	0.27	0.24	1.51	1.04
22049	8.38	8.46	0.09	0.06	0	0	0.29	0.23	1.75	1.28
22050	8.21	8.56	0.09	0.06	0	0	0.4	0.25	1.85	1.14
22051	8.22	8.33	0.11	0.05	0	0	0.29	0.25	2.29	0.97
22052	8.16	8.3	0.114	0.049	0	0	0.3	0.29	2.28	0.98
22053	8.11	8.22	0.118	0.082	0	0	0.34	0.27	2.36	1.64
22054	8.16	8.27	0.101	0.064	0	0	0.29	0.21	2.02	1.28
22055	8.19	8.22	0.101	0.061	0	0	0.3	0.27	2.02	1.22
22057	8.18	8.15	0.09	0.06	0	0	0.26	0.21	1.75	1.21
22058	8.15	8.16	0.11	0.07	0	0	0.3	0.3	2.15	1.41
22059	8.27	8.3	0.09	0.06	0	0	0.46	0.36	1.75	1.28
22060	8.25	8.23	0.27	0.07	0	0	0.46	0.4	5.41	1.38
22061	8.3	8.32	0.27	0.07	0	0	0.47	0.36	5.42	1.38
22062	8.4	8.2	0.13	0.08	0	0	0.59	0.41	2.52	1.68
22063	8.2	8.29	0.13	0.12	0	0	0.44	0.33	2.62	2.49
22064	8.08	8.15	0.141	0.094	0	0	0.37	0.42	2.82	1.88
22065	8.26	8.36	0.131	0.118	0	0	0.42	0.36	2.62	2.36
22068	7.95	7.9	0.18	0.15	0	0	0.51	0.4	3.7	2.96
22069	7.96	8	0.134	0.08	0	0	0.32	0.27	2.69	1.55
22070	8.24	8.3	0.124	0.07	0	0	0.29	0.22	2.19	1.34
22071	8.16	8.25	0.145	0.114	0	0	0.36	0.33	2.89	2.29
22072	8.14	8.21	0.126	0.084	0	0	0.4	0.3	2.52	1.68
22073	8.26	8.33	0.131	0.111	0	0	0.36	0.37	2.62	2.22
22074	8.2	8.23	0.108	0.101	0	0	0.33	0.32	2.15	2.02
22075	8.23	8.25	0.121	0.104	0	0	0.34	0.33	2.42	2.02
22082	8.07	8.11	0.101	0.096	0	0	0.21	0.21	1.92	1.92
22083	8.2	8.27	0.1	0.09	0	0	0.21	0.19	2.02	1.75
22084	8.23	8.28	0.11	0.06	0	0	0.22	0.21	2.25	1.28
22085	8.21	8.16	0.09	0.94	0	0	0.24	0.21	1.88	1.71
22086	8.26	8.25	0.09	0.07	0	0	0.22	0.21	1.75	1.34
22087	8.2	8.2	0.12	0.121	0	0	0.22	0.21	2.42	2.39
22088	8.18	8.2	0.1	0.08	0	0	0.26	0.22	1.92	1.55
22095	8.26	8.16	0.12	0.08	0	0	0.24	0.21	2.45	1.68
22096	8.27	8.3	0.1	0.07	0	0	0.21	0.21	1.95	1.41
22097	8.23	8.23	0.1	0.09	0	0	0.21	0.21	2.08	1.75
22098	8.32	8.27	0.8	0.07	0	0	0.21	0.19	2.02	1.38
22099	8.22	8.18	0.11	0.09	0	0	0.25	0.24	2.19	1.82

TLACOJALPAN II

IDUEG	PH		NITROGEN (%)		PHOSPOROUS (ppm)		POTASSIUM (cmol. Kg-1)		ORGANIC MATER(%)	
	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)
22100	8.12	8.27	0.12	0.08	0	0	0.21	0.2	2.32	1.61
22105	8.14	8.19	0.11	0.08	0	0	0.32	0.29	2.22	1.51
22106	8.15	8.25	0.13	0.08	0	0	0.35	0.3	2.55	1.58
22107	8.17	8.28	0.12	0.07	0	0	0.34	0.29	2.42	1.45
22108	8.25	8.32	0.11	0.1	0	0	0.34	0.28	2.29	1.95
22109	7.83	8.17	0.12	0.1	0	0	0.3	0.27	2.39	1.92
22112	8.26	8.23	0.096	0.07	0	0	0.3	3.17	1.88	1.48
22114	7.95	7.72	0.1	0.091	0	0	7.28	5.16	2.08	1.82
Media =	8.1975	8.24604167	0.13354167	0.130645833	0	0	0.46104167	0.437916667	2.360625	1.627291667
Varianza =	0.012623404	0.0194457	0.01096549	0.039870531	0	0	1.01798825	0.663233865	0.55549109	0.178986126

SAN MARCOS

IDUEG	PH		NITROGEN (%)		PHOSPOROUS (ppm)		POTASSIUM (cmol. Kg-1)		ORGANIC MATER(%)	
	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)
25001	7.97	8.12	0.13	0.07	0	0	0.27	0.16	2.69	1.34
25002	8.01	8.2	0.12	0.06	0	0	0.25	0.19	2.41	1.27
25003	8.1	8.18	0.13	0.06	0	0	0.27	0.27	2.65	1.23
25004	8.19	8.21	0.15	0.13	0	0	0.27	0.27	3.09	2.55
25005	8.22	8.31	0.15	0.12	0	0	0.23	0.21	2.97	2.36
25006	8.23	8.23	0.14	0.11	0	0	0.26	0.25	2.86	2.29
25007	8.19	8.22	0.13	0.12	0	0	0.27	0.27	2.57	2.49
25008	8.24	8.23	0.13	0.08	0	0	0.29	0.27	2.63	1.7
25009	8.28	8.3	0.1	0.08	0	0	0.31	0.27	2.08	1.61
25010	8.12	8.21	0.11	0.07	0	0	0.33	0.27	2.15	1.48
25011	8.37	8.3	0.11	0.07	0	0	0.33	0.3	2.16	1.42
25012	7.94	8.11	0.1	0.07	0	0	0.33	0.33	2.08	1.39
25013	8.27	8.22	0.09	0.07	0	0	0.33	0.33	1.82	1.48
25014	7.89	8.14	0.07	0.07	0	0	0.3	0.27	1.45	1.32
25015	8.12	8.1	0.1	0.07	0	0	0.27	0.27	1.95	1.34
25016	8.27	8.14	0.07	0.06	0	0	0.27	0.25	1.34	1.26
25017	8.19	8.25	0.11	0.07	0	0	0.27	0.23	8.19	8.25
25018	8.08	8.09	0.1	0.06	0	0	0.27	0.27	1.15	0.71
25019	8.14	8.24	0.09	0.06	0	0	0.27	0.25	1.74	1.21
25020	8.24	8.22	0.09	0.07	0	0	0.27	0.26	1.81	1.35
25021	8.32	8.01	0.1	0.07	0	0	0.27	0.27	2.1	1.41
25022	8.01	8.11	0.01	0.07	0	0	0.27	0.27	2.05	1.36
Media =	8.154090909	8.18818182	0.10590909	0.077727273	0	0	0.28181818	0.260454545	2.451818182	1.855454545
Varianza =	0.016549134	0.00593939	0.00096818	0.000456494	0	0	0.00077749	0.001480736	1.91212987	2.25361645

DATA BASE OF LABORATORY RESULTS OF FIVE VARIABLES ON SOIL FERTILITY IN TWO DEPTH A(-30 cm) AND B(30-60 cm) FOR TLACOJALPAN-AMBROSIO MODULE

AMBROSIO I											
IDUEG	PH		NITROGEN (%)		PHOSPOROUS (ppm)		POTASSIUM (cmol. Kg-1)		ORGANIC MATER(%)		
	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	
23001	7.75	7.83	0.11	0.08	0	0	0.24	0.23	2.16	1.58	
23002	7.96	8.02	0.1	1.71	0	0	0.27	0.27	2.01	1.54	
23003	7.37	7.53	0.11	0.07	0	0	0.26	0.25	2.17	1.33	
23004	7.22	7.58	0.11	0.08	0	0	0.27	0.27	2.28	1.68	
23005	7.53	7.74	0.11	0.08	0	0	0.27	0.26	2.25	1.61	
23006	7.77	7.83	0.11	0.08	0	0	0.2	0.19	2.23	1.65	
23007	7.8	7.91	0.12	0.07	0	0	0.21	0.18	2.35	1.31	
23008	6.9	7.23	0.11	0.08	0	0	0.27	0.17	2.23	1.65	
23009	6.98	7.3	0.11	0.08	2.1	0	0.23	0.15	2.24	1.63	
23010	7.3	7.53	0.12	0.07	0	0	0.11	0.11	2.48	1.47	
23011	7.05	7.5	0.13	0.08	0	0	0.13	0.1	2.54	1.6	
23012	6.95	6.97	0.14	0.07	0.23	0.21	0.25	0.11	2.83	1.34	
23013	7.05	7.24	0.13	0.07	0	0	0.17	0.12	2.53	1.48	
23014	7.13	7.15	0.12	0.07	0	0	0.19	0.11	2.49	1.46	
23015	6.92	6.98	0.15	0.07	2.3	2.2	0.33	0.1	3.02	1.47	
25016	6.78	7.11	0.15	0.07	2.1	0	0.27	0.13	2.94	1.43	
25017	7.7	7.92	0.14	0.07	0	0	0.22	0.1	2.83	1.45	
25018	7.58	7.79	0.12	0.07	0	0	0.13	0.1	2.41	1.31	
25019	7.21	7.49	0.097	0.07	0	0	0.1	0.11	1.94	1.41	
25020	6.7	7.1	0.1	0.07	2.3	0	0.11	0.1	1.97	1.39	
Media =	7.2825	7.4875	0.11935	0.1555	0.4515	0.1205	0.2115	0.158	2.395	1.4895	
Varianza =	0.143535526	0.11294605	0.00025371	0.133899737	0.809255526	0.24177342	0.00446605	0.004164211	0.098857895	0.014752368	

AMBROSIO II											
IDUEG	PH		NITROGEN (%)		PHOSPOROUS (ppm)		POTASSIUM (cmol. Kg-1)		ORGANIC MATER(%)		
	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	
24003	8.09	8.2	0.11	0.02	0	0	0.31	0.25	2.24	0.41	
24004	8.06	8.2	0.11	0.01	0	0	0.3	0.27	2.21	0.26	
24007	7.86	7.87	0.11	0.07	0	0	0.32	0.25	2.17	1.35	
24008	7.92	7.94	0.11	0.06	0	0	0.26	0.21	2.16	1.2	
24009	8.03	8.11	0.13	0.09	0	0	0.26	0.23	2.63	1.74	
24010	7.96	7.88	0.1	0.06	0	0	0.24	0.2	1.95	1.13	
24011	7.98	8.09	0.11	0.08	0	0	0.26	0.15	2.17	1.53	
24012	8.13	8.17	0.1	0.08	0	0	0.27	0.16	2.15	1.61	
24015	7.84	8.01	0.14	0.06	0	0	0.27	0.16	2.75	1.17	
24016	7.94	8.03	0.14	0.04	0	0	0.27	0.16	8.82	0.8	
24017	7.27	7.43	0.11	0.06	0	0	0.27	0.14	2.23	1.11	

AMBROSIO II											
IDUEG	PH		NITROGEN (%)		PHOSPOROUS (ppm)		POTASSIUM (cmol. Kg-1)		ORGANIC MATER(%)		
	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	
24018	8.03	8.1	0.12	0.07	0	0	0.24	0.19	2.37	1.33	
24021	7.4	7.64	0.11	0.06	0	0	0.21	0.17	1.27	0.69	
24022	7.45	7.56	0.11	0.06	0	0	0.22	0.15	2.17	1.23	
24027	7.74	7.66	0.11	0.07	0	0	0.17	0.17	2.28	1.41	
24028	7.78	7.89	0.11	0.07	0	0	0.17	0.17	2.29	1.38	
Media =	7.8425	7.92375	0.114375	0.06	0	0	0.2525	0.189375	2.61625	1.146875	
Varianza =	0.066806667	0.057185	0.00014625	0.00044	0	0	0.00188667	0.00168625	2.834651667	0.172129583	

DATA BASE OF LABORATORY RESULTS OF FIVE VARIABLES ON SOIL FERTILITY IN TWO DEPTH A(-30 cm) AND B(30-60 cm) FOR TESECHOACAN-CURAZAO MODULE

TESECHOACAN											
IDUEG	PH		NITROGEN (%)		PHOSPOROUS (ppm)		POTASSIUM (cmol. Kg-1)		ORGANIC MATER(%)		
	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	
31001	6.98	6.53	0.11	0.07	4.15	0	0.15	0.13	2.19	1.35	
31002	7.16	6.44	0.11	0.08	0	0	0.16	0.09	2.29	1.55	
31003	6.71	6.56	0.14	0.08	0	0	0.17	0.07	2.76	1.55	
31004	6.62	7.03	0.1	0.07	0	0	0.17	0.1	2.08	1.34	
31005	6.79	7.52	0.09	0.05	0	0	0.17	0.16	1.78	0.94	
31006	6.69	7.39	0.09	0.05	0	0	0.1	0.1	1.83	0.97	
31007	6.61	7.19	0.1	0.06	0	0	0.1	0.09	2.02	1.14	
31008	6.25	6.87	0.11	0.07	0	0	0.12	0.09	2.25	1.31	
31009	6.24	6.94	0.13	0.07	0	0	0.13	0.07	2.69	1.34	
31010	6.54	6.92	0.08	0.06	0	0	0.12	0.07	1.61	1.14	
31011	6.83	7.21	0.09	0.06	0	0	0.13	0.12	1.82	1.21	
31012	6.5	6.7	0.09	0.07	0	0	0.19	0.19	1.75	1.34	
31013	6.62	6.81	0.09	0.06	0	0	0.23	0.17	1.75	1.21	
31014	7.04	7.15	0.09	0.05	0	0	0.35	0.16	1.75	1.01	
31015	6.17	6.71	0.09	0.05	0	0	0.25	0.17	1.82	1.08	
31016	6.32	6.32	0.08	0.04	0	0	0.23	0.15	1.68	0.87	
31017	6.42	6.78	0.1	0.04	0	0	0.25	0.17	1.95	0.87	
31018	7.12	7.64	0.1	0.05	0	0	0.21	0.2	2.08	1.01	
31019	6.01	6.93	0.09	0.07	0	0	0.16	0.14	1.82	1.34	
31020	6.91	7.27	0.12	0.05	0	0	0.18	0.17	2.35	1.01	
31021	6.71	7.09	0.08	0.04	0	0	0.17	0.16	1.55	0.81	
31022	6.27	7.03	0.11	0.07	0	0	0.14	0.11	2.29	1.41	
31023	6.88	7.24	0.1	0.05	0	0	0.13	0.11	2.08	0.94	
31024	6.56	6.76	0.09	0.07	0	0	0.11	0.07	1.82	1.48	
31025	6.65	6.94	0.09	0.06	0	0	0.08	0.09	1.82	1.28	
31026	6.38	7.06	0.11	0.05	2.41	0	0.07	0.09	2.15	1.01	

TESECHOACAN											
IDUEG	PH		NITROGEN (%)		PHOSPOROUS (ppm)		POTASSIUM (cmol. Kg-1)		ORGANIC MATER(%)		
	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	
31027	6.65	7.42	0.1	0.06	3.89	0	0.08	0.17	2.02	1.14	
31030	5.76	6.04	0.12	0.05	2.18	0	0.09	0.11	2.42	1.01	
31031	6.2	6.7	0.08	0.06	3.89	0	0.11	0.1	1.61	1.14	
31032	6.41	6.96	0.1	0.07	1.93	0	0.1	0.13	1.95	1.34	
31033	6.75	6.78	0.09	0.06	2.11	0	0.11	0.14	1.75	1.14	
31034	6.6	7.08	0.09	0.07	1.12	0	0.24	0.27	1.75	1.41	
31035	5.84	6.3	0.08	0.07	0.95	0	0.27	0.26	1.68	1.34	
31036	7.11	7.26	0.11	0.07	0	0	0.26	0.27	2.15	0.86	
31037	7.18	7.11	0.05	0.02	0.28	0.28	12.7	11.17	1.08	0.34	
31038	6.28	6.29	0.07	0.02	0	0	0.24	0.23	1.45	0.47	
31039	6.97	7.34	0.09	0.06	0	0	0.25	0.21	1.88	1.14	
31040	6.78	7.33	0.1	0.04	0	0	0.27	0.21	1.95	0.87	
31041	6.59	6.7	0.04	0.03	0	0	0.27	0.27	0.81	0.54	
31042	6.08	6.48	0.06	0.04	0	0	0.26	0.23	1.21	0.81	
31043	7.08	7.56	0.05	0.02	0	0	0.25	0.24	0.94	0.4	
31044	6.62	6.62	0.14	0.08	0	0	0.25	0.23	2.89	1.61	
31047	5.78	6.6	0.07	0.04	0	0	0.23	0.12	1.41	0.74	
31048	6.15	6.79	0.1	0.03	0	0	0.21	0.11	2.02	0.54	
31051	6.25	7.11	0.06	0.02	0	0	0.34	0.01	1.14	0.34	
31052	6.23	6.34	0.05	0.03	0	0	0.28	0.12	0.94	0.61	
Media =	6.549782609	6.90956522	0.09195652	0.053913043	0.498043478	0.00608696	0.45826087	0.387826087	1.848478261	1.05	
Varianza =	0.137371063	0.13905758	0.0004872	0.000291014	1.267762754	0.00170435	3.40941913	2.644790725	0.205110966	0.109724444	

CURAZAO											
IDUEG	PH		NITROGEN (%)		PHOSPOROUS (ppm)		POTASSIUM (cmol. Kg-1)		ORGANIC MATER(%)		
	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	
32050	7.1	7.36	0.14	0.11	0	0	0.12	0.1	2.82	2.15	
32049	5.95	6.96	0.15	0.11	0	0	0.13	0.1	2.96	2.29	
32053	6.79	7.25	0.11	0.06	0	0	0.14	0.09	2.15	1.28	
32054	6.82	7.24	0.13	0.08	0	0	0.13	0.08	2.69	1.77	
32055	6.51	7.07	0.11	0.07	0	0	0.14	0.07	2.26	1.39	
32056	6.42	6.9	0.11	0.06	0	0	0.13	0.09	2.15	1.75	
32057	6.41	6.51	0.14	0.12	0	0	0.2	0.09	2.82	2.49	
32058	6.67	7.29	0.12	0.11	0	0	0.23	0.08	2.43	2.17	
32059	6.71	7.26	0.1	0.06	0	0	0.27	0.06	1.95	1.21	
32060	6.89	6.88	0.14	0.1	0	0	0.19	0.07	2.76	2.08	
32062	5.57	5.81	0.13	0.11	0	0	0.1	0.07	2.62	2.29	
32065	6.54	6.9	0.14	0.11	0	0	0.1	0.07	2.76	2.15	
32066	6.34	6.55	0.11	0.1	0	0	0.11	0.07	2.26	1.98	
32068	5.96	6.15	0.14	0.12	0	0	0.11	0.08	2.76	2.49	

CURAZAO											
IDUEG	PH		NITROGEN (%)		PHOSPOROUS (ppm)		POTASSIUM (cmol. Kg-1)		ORGANIC MATER(%)		
	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	
32069	5.98	6.22	0.14	0.12	0	0	0.1	0.07	2.73	2.37	
32070	6.54	7.04	0.13	0.11	0	0	0.09	0.06	2.52	2.11	
32071	6.7	6.85	0.09	0.06	0	0	0.11	0.09	1.83	1.25	
32072	6.64	6.89	0.08	0.04	0	0	0.1	0.08	1.55	0.74	
32073	6.13	6.06	0.07	0.04	0	0	0.1	0.09	1.49	0.87	
32074	6.63	5.67	0.09	0.08	0	0	0.1	0.08	1.88	1.55	
32075	6.07	6.45	0.11	0.08	0	0	0.09	0.07	2.26	1.51	
32076	6.95	7.17	0.12	0.07	0	0	0.07	0.16	2.42	1.48	
32077	7.22	7.39	0.11	0.07	0	0	0.08	0.12	2.21	1.35	
32078	6.93	6.99	0.07	0.04	0	0	0.1	0.08	1.48	0.86	
32079	6.84	7.26	0.07	0.05	0	0	0.09	0.06	1.34	1.08	
32080	5.71	5.63	0.08	0.07	0	0	0.1	0.06	1.58	1.36	
32081	6.09	6.8	0.08	0.07	0	0	0.09	0.07	1.65	1.47	
32086	6.87	7.04	0.07	0.07	0	0	0.09	0.08	1.48	1.34	
32087	7.16	7.4	0.07	0.06	0	0	0.22	0.12	1.48	1.18	
32088	7.02	7.34	0.07	0.05	0	0	0.27	0.16	1.48	1.01	
32089	6.42	6.46	0.07	0.05	0	0	0.11	0.07	1.43	0.98	
32090	6.05	6.26	0.07	0.04	0	0	0.12	0.06	1.41	0.83	
32091	6.24	6.58	0.07	0.04	0	0	0.1	0.09	1.39	0.87	
32092	6.22	6.55	0.07	0.04	0	0	0.12	0.09	1.41	0.9	
32093	6.74	6.67	0.07	0.05	0	0	0.11	0.07	1.46	0.95	
32094	6.3	6.53	0.07	0.05	0	0	0.09	0.07	1.4	0.93	
32095	6.39	6.54	0.07	0.04	0	0	0.1	0.07	1.42	0.9	
32096	6.05	6.23	0.07	0.05	0	0	0.12	0.08	1.45	0.87	
Media =	6.488684211	6.74078947	0.09947368	0.072631579	0	0	0.12552632	0.083421053	2.003684211	1.480263158	
Varianza =	0.169227952	0.23959666	0.00081593	0.000760455	0	0	0.00249566	0.00054744	0.306050925	0.30705128	

DATA BASE OF LABORATORY RESULTS OF FIVE VARIABLES ON SOIL FERTILITY IN TWO DEPTH A(-30 cm) AND B(30-60 cm) FOR LOS NARANJOS MODULE

POZO 28											
IDUEG	PH		NITROGEN (%)		PHOSPOROUS (ppm)		POTASSIUM (cmol. Kg-1)		ORGANIC MATER(%)		
	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	
41001	6.02	6.33	0.13	0.07	0	0	0.09	0.08	2.65	1.34	
41002	6.42	7.28	0.13	0.07	0	0	0.09	0.07	2.59	1.37	
41003	6.2	6.47	0.12	0.06	0	0	0.09	0.08	2.48	1.29	
41004	6.16	6.57	0.13	0.07	0	0	0.1	0.09	2.56	1.34	
41005	6.31	7.1	0.12	0.07	0	0	0.1	0.08	2.29	0.81	
41006	6.3	6.28	0.11	0.04	0	0	0.1	0.07	1.21	1.01	
41007	6.31	6.57	0.06	0.05	0	0	0.18	0.16	6.08	6.4	

POZO 28

IDUEG	PH		NITROGEN (%)		PHOSPOROUS (ppm)		POTASSIUM (cmol. Kg-1)		ORGANIC MATER(%)	
	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)
41008	6.08	6.4	0.08	0.06	0.72	2.15	0.16	0.14	1.63	1.22
41009	5.99	6.11	0.94	0.08	9.36	3.9	0.12	0.1	2.15	1.61
41010	6.05	6.67	0.11	0.08	8.95	3.27	0.12	0.09	2.13	1.53
41011	6.32	6.66	0.1	0.07	7.63	3.15	0.11	0.1	2.01	1.43
Media =	6.196363636	6.58545455	0.18454545	0.065454545	2.423636364	1.13363636	0.11454545	0.096363636	2.525454545	1.759090909
Varianza =	0.021185455	0.11926727	0.06326727	0.000147273	16.18332545	2.63114545	0.00088727	0.000825455	1.580847273	2.419629091

POZO 868

IDUEG	PH		NITROGEN (%)		PHOSPOROUS (ppm)		POTASSIUM (cmol. Kg-1)		ORGANIC MATER(%)	
	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)
48001	4.81	5.04	0.07	0.03	0	0	0.17	0.17	1.41	0.61
48002	5.02	5.16	0.07	0.03	0	0	0.16	0.16	1.36	0.62
48003	5.03	5.08	0.06	0.04	0	0	0.15	0.17	1.25	0.77
48004	5.09	5.23	0.06	0.04	0	0	0.17	0.18	1.18	0.82
48005	5.11	5.36	1.14	0.87	0	0	0.17	0.17	1.14	0.87
48006	5.02	5.05	0.1	0.05	0	0	0.17	0.19	1.29	0.92
48007	5.06	5.28	0.1	0.06	0	0	0.17	0.18	1.98	1.15
48008	4.78	4.78	0.1	0.1	0	0	0.16	0.15	1.97	1.97
48009	4.82	4.98	0.1	0.05	0	0	0.19	0.19	1.95	1.08
Media =	4.971111111	5.10666667	0.2	0.141111111	0	0	0.16777778	0.173333333	1.503333333	0.978888889
Varianza =	0.016861111	0.030425	0.124575	0.075161111	0	0	0.00011944	0.000175	0.1275	0.171361111

POZO 5

IDUEG	PH		NITROGEN (%)		PHOSPOROUS (ppm)		POTASSIUM (cmol. Kg-1)		ORGANIC MATER(%)	
	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)
42001	4.83	5.6	0.04	0.01	0	0	0.06	0.07	0.81	0.2
42002	4.72	5.21	0.04	0.01	0	0	0.06	0.07	0.82	0.27
42003	4.84	6.04	0.04	0.02	0	0	0.07	0.06	0.81	0.34
42004	4.9	5.02	0.04	0.02	0	0	0.05	0.06	0.83	0.35
42005	4.77	5.2	0.04	0.01	0	0	0.06	0.07	0.74	0.13
42006	5.32	5.74	0.05	0.02	0	0	0.06	0.07	0.97	0.39
42007	5.04	5.72	0.07	0.03	0	0	0.06	0.07	1.34	0.61
42008	5.59	6.35	0.07	0.03	0	0	0.06	0.07	1.35	0.58
Media =	5.00125	5.61	0.04875	0.01875	0	0	0.06	0.0675	0.95875	0.35875
Varianza =	0.092555357	0.2054	0.00018393	0.0000696429	0	0	0.000028571	0.000021429	0.060926786	0.028412500

DATA BASE OF LABORATORY RESULTS OF FIVE VARIABLES ON SOIL FERTILITY IN TWO DEPTH A(-30 cm) AND B(30-60 cm) FOR LOS NARANJOS MODULE

POZO 34											
IDUEG	PH		NITROGEN (%)		PHOSPOROUS (ppm)		POTASSIUM (cmol. Kg-1)		ORGANIC MATER(%)		
	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	
46011	6.14	6.6	0.06	0.05	0	0	0.07	0.09	1.15	1.03	
46012	5.82	6.54	0.05	0.04	0	0	0.06	0.08	1.01	0.87	
46013	5.88	6.6	0.05	0.04	0	0	0.06	0.09	1.05	0.9	
46014	5.86	7.11	0.07	0.06	0	0	0.07	0.09	1.48	1.21	
46015	6.72	6.6	0.07	0.06	0	0	0.07	0.09	1.43	1.19	
Media =	6.084	6.69	0.06	0.05	0	0	0.066	0.088	1.224	1.04	
Varianza =	0.14228	0.0558	0.0001	0.0001	0	0	0.00003	0.00002	0.04738	0.02500	

POZO 36											
IDUEG	PH		NITROGEN (%)		PHOSPOROUS (ppm)		POTASSIUM (cmol. Kg-1)		ORGANIC MATER(%)		
	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	A (0-30 cm)	B (30-60 cm)	
47001	6.18	6.6	0.07	0.04	0	0	0.07	0.08	1.34	0.87	
47002	6.9	6.9	0.06	0.04	0	0	0.06	0.08	0.71	0.49	
47003	6.77	6.72	0.06	0.04	0	0	0.1	0.08	1.16	0.85	
47004	6.52	7.07	0.06	0.04	0	0	0.12	0.07	1.21	0.86	
47005	6.92	7.13	0.06	0.04	0	0	0.11	0.07	1.12	0.83	
47006	6.2	6.84	0.05	0.04	0	0	0.13	0.08	1.01	0.87	
47007	6.39	6.57	0.08	0.06	0	0	0.18	0.11	1.61	1.28	
47008	6.6	6.96	0.06	0.05	0	0	0.11	0.08	1.49	0.99	
47009	6.12	6.66	0.06	0.01	0	0	0.13	0.08	1.28	0.13	
47010	6.42	6.65	0.06	0.01	0	0	0.13	0.09	1.25	0.18	
Media =	6.502	6.81	0.062	0.037	0	0	0.114	0.082	1.218	0.735	
Varianza =	0.086106667	0.039933333	0.00006222	0.000245556	0	0	0.00113778	0.000128889	0.062417778	0.13005	

**CATHIONIC EXCHANGE CAPACITY (CEC cmol.kg-1) FOR SOILS OF MODULES II, III AND IV OF THE
PAPALOAPAN RIVER BASIN**

MODULE	IDUEG	SUBMODULE	CATHIONIC EXCHANGE CAPACITY					
			1 cm	2 cm	3 cm	4 cm	5 cm	6 cm
Tlacojalpan- Ambrosio	21011	Tlacojalpan I	118.37	112.63	112.63	107.61	173.97	147.06
	22057	Tlacojalpan II	125.54	125.54	102.23	100.43	132.71715	60.97815
	24002	Ambrosio II	137.74	96.85	50.22	64.57	61.28	
	24008	Ambrosio II	33.74	142.04	159.04	134.51	161.41	
	24020	Ambrosio II	35.44	29.67	151.37	114.78	130.92	
	25021	San Marcos	130.92	138.1	125.54			
Curazao-Tesechoacán	31017	Tesechoacán	28.4	114.78	125.54	132.72	62.77	93.26
	31021	Tesechoacán	20.13	17.71	15.46	15.38	23.55	20.94
	31032	Tesechoacán	22.59	25.83	24.61	26.11		
	31037	Tesechoacán	29.75	104.02155	106.89111	132.71715	125.54325	111.19545
	31040	Tesechoacán	18.88	17.12	14.83	8.45	5.57	5.53
	31042	Tesechoacán	19.26	18.25	16.13	16.09	20.41	18.67
	31046	Tesechoacán	21.51	23.42	37.56	25.98		
	32001	Curazao	24.89	26.55				
	32055	Curazao	34.44	61.27	149.21712	123.39108	91.10853	
	32057	Curazao	41.56	21.12	24.58	23.33	24.97	
	32065	Curazao	23.41	23.78	26.91	28.05	22.14	
	32078	Curazao	20.21	21.62	22.97	21.85		
	32081	Curazao	31.86	27.79	25.81	24.68		
	32092	Curazao	22.48	16.94	15.89	17.35	11.79	15.12
Los Naranjos	41001	Pozo 28	7.63	8.91	6.23	8.45	9.89	
	42003	Pozo 5	18.42	24.68	28.74	55.95642	175.76055	111.19545
	42006	Pozo 5	23.23	28.95	26.41	19.75	35.52	
	46012	Pozo 34	25.48	32.62	28.57	24.91	22.36	22.05
	47007	Pozo 36	21.23	24.78	20.59	22.49	22.34	15.46
	48004	Pozo 868	18.95	22.44	21.13	18.52	16.95	



Laboratory Analysis for Soil Profiles



Municipality: 176

Module: 2 Submodule: 1

IDUEG: (21011) 1760201011

Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
	1.- HUMIDITY %	20.27	20.02	14.23	15.26	18.25	18.37
	7.- pH IN WATER (1:2)	8	7.92	7.69	7.74	8.15	8.1
	8.- ORGANIC MATTER %	4.98	2.82	2.02	1.48	1.48	1.34
	9.- RESERVE OF CARBON	2.89	1.64	1.17	0.86	0.86	0.78
	10.- TOTAL NITROGEN%	0.25	0.14	0.1	0.07	0.07	0.07
	12.- POTASSIUM cmol. kg-1	4.67	1.54	4.29	4.06	4.14	3.85
	13.- CALCIUM cmol. kg-1	36.1	29.3	23.8	23.2	25.2	25.6
	14.- MAGNESIUM cmol. kg-1	5.3	1.4	3.4	6	8.3	6.1
	16.- Relation Ca / Mg	5.8	20.8	6.9	3.9	3	4.2
ACIDITY							
	35.- CIC cmol.(+)kg-1	118.37	112.63	112.63	107.61	173.97	147.06



Laboratory Analysis for Soil Profiles



Municipio: 176

Módulo: 2 Submódulo: 2

IDUEG: (22057) 1760202057

Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
	1.- HUMIDITY %	20.07	20.31	19.83	20.39	17.41	18.1
	7.- pH IN WATER (1:2)	7.77	7.87	7.88	7.95	8.04	8.19
	8.- ORGANIC MATTER %	5.18	3.9	2.29	2.22	1.48	1.48
	9.- RESERVE OF CARBON	3	2.26	1.33	1.29	0.86	0.86
	10.- TOTAL NITROGEN%	0.26	0.19	0.11	0.11	0.07	0.07
	12.- POTASSIUM cmol. kg-1	1.37	1.26	1.05	0.51	0.46	0.14
	13.- CALCIUM cmol. kg-1	29.5	27.7	21.5	21.3	19.6	26.5
	14.- MAGNESIUM cmol. kg-1	3.4	0.8	3.3	2.2	3.3	2
	16.- Relation Ca / Mg	8.5	35.4	6.5	9.7	6	13
ACIDITY							
	35.- CIC cmol.(+)kg-1	125.54	125.54	102.23	100.43	132.7172	60.97815



Laboratory Analysis for Soil Profiles



Municipio: 176

Módulo: 2 Submódulo: 4

IDUEG: (24002) 1760204002

Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
	1.- HUMIDITY %	17.74	18.63	15.47	19.62	18.75	
	7.- pH IN WATER (1:2)	8.01	8.4	8.12	8.21	8.15	
	8.- ORGANIC MATTER %	2.82	1.75	1.61	0.81	13.58	
	9.- RESERVE OF CARBON	1.64	1.01	0.94	0.47	7.88	
	10.- TOTAL NITROGEN%	0.14	0.09	0.08	0.04	0.68	
	12.- POTASSIUM cmol. kg-1	5.47	4.99	0.16	0.16	0.15	
	13.- CALCIUM cmol. kg-1	22.1	19.3	27.1	26.2	26.2	
	14.- MAGNESIUM cmol. kg-1	8.3	4.9	2.7	3.9	3.8	
	16.- Relation Ca / Mg	2.7	4	10.2	6.7	6.9	
ACIDITY							
	35.- CIC cmol.(+)kg-1	137.74	96.85	50.22	64.57	61.28	



Laboratory Analysis for Soil Profiles



Municipio: 176

Módulo: 2 Submódulo: 4

IDUEG: (24008) 1760204008

Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
		17.34	17.02	20.77	22.43	9.8	
	1.- HUMIDITY %	6.48	7.21	7.16	7.23	8.27	
	7.- pH IN WATER (1:2)	4.84	2.29	1.88	1.55	1.34	
	8.- ORGANIC MATTER %	2.81	1.33	1.09	0.9	0.78	
	9.- RESERVE OF CARBON	0.24	0.11	0.09	0.08	0.07	
	10.- TOTAL NITROGEN%	0.31	0.51	0.46	0.33	0.27	
	12.- POTASSIUM cmol. kg-1	24.1	23.4	19.3	18	19.1	
	13.- CALCIUM cmol. kg-1	4.1	4.9	4.2	4.2	4.3	
	14.- MAGNESIUM cmol. kg-1	0.57					
	16.- Relation Ca / Mg	5.9	4.8	4.6	4.3	4.5	
ACIDITY							
	35.- CIC cmol.(+)kg-1	33.74	142.04	159.26	134.51	161.41	



Laboratory Analysis for Soil Profiles



Municipio: 176

Módulo: 2 Submódulo: 3

IDUEG: (24020) 1760204020

Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
	1.- HUMIDITY %	19.03	18.67	18.8	20.07	23.67	
	7.- pH IN WATER (1:2)	6.62	6.74	7.13	7.62	8.03	
	8.- ORGANIC MATTER %	3.36	2.15	1.21	1.21	0.74	
	9.- RESERVE OF CARBON	1.95	1.25	0.7	0.7	0.43	
	10.- TOTAL NITROGEN%	0.17	0.11	0.06	0.06	0.04	
	12.- POTASSIUM cmol. kg-1	0.2	0.07	0.16	0.16	0.14	
	13.- CALCIUM cmol. kg-1	23.5	19.9	21.8	18.8	24.5	
	14.- MAGNESIUM cmol. kg-1	6.7	4.9	3	4.7	2.8	
	16.- Relation Ca / Mg	0.39	0.32				
ACIDITY							
	35.- CIC cmol.(+)kg-1	3.5	4.1	7.3	4	8.7	
	35.- CIC cmol.kg-1	35.44	29.67	151.37	114.78	130.92	



Laboratory Analysis for Soil Profiles



Municipio: 176

Módulo: 2 Submódulo: 5

IDUEG: (25021) 1760205021

Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
	1.- HUMIDITY %	11.98	14.39	15.24			
	7.- pH IN WATER (1:2)	7.89	8.1	8.15			
	8.- ORGANIC MATTER %	5.04	2.69	1.55			
	9.- RESERVE OF CARBON	2.93	1.56	0.9			
	10.- TOTAL NITROGEN%	0.25	0.13	0.08			
	12.- POTASSIUM cmol. kg-1	6.17	1.26	1.13			
	13.- CALCIUM cmol. kg-1	32.6	30.3	28.4			
	14.- MAGNESIUM cmol. kg-1	6	5.2	3.6			
	16.- Relation Ca / Mg	5.5	5.8	12.5			
ACIDITY							
	35.- CIC cmol.(+)kg-1	130.92	138.10	125.54			



Laboratory Analysis for Soil Profiles



Municipio: 169

Módulo: 3 Submódulo: 1

IDUEG: (31017) 1690301017

Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
	1.- HUMIDITY %	12.38	10.64	11.55	16.27	17.57	18.32
	7.- pH IN WATER (1:2)	6.89	8.42	8.27	7.94	8.09	8.12
	8.- ORGANIC MATTER %	3.9	1.48	1.01	0.74	0.47	0.47
	9.- RESERVE OF CARBON	2.26	0.86	0.59	0.43	0.27	0.27
	10.- TOTAL NITROGEN%	0.19	0.07	0.05	0.04	0.02	0.02
	12.- POTASSIUM cmol. kg-1	0.11	0.16	0.14	0.14	0.14	0.14
	13.- CALCIUM cmol. kg-1	14.8	11	9.4	8.3	5.8	6.1
	14.- MAGNESIUM cmol. kg-1	12.5	6.3	4.1	4.5	6.4	6.8
	16.- Relation Ca / Mg	0.33					
ACIDITY							
	35.- CIC cmol.(+)kg-1	1.2	1.8	2.3	1.8	0.9	0.9
	35.- CIC cmol.kg-1	28.4	114.78	125.54	132.72	62.77	93.26



Laboratory Analysis for Soil Profiles



Municipio: 169

Módulo: 3 Submódulo: 1

IDUEG: (31021) 1690301021

Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
	1.- HUMIDITY %	15.93	13	16.35	16.51	15.71	13.01
	7.- pH IN WATER (1:2)	5.97	6.42	6.61	6.47	6.85	6.69
	8.- ORGANIC MATTER %	2.82	2.15	1.61	1.48	1.48	1.41
	9.- RESERVE OF CARBON	1.64	1.25	0.94	0.86	0.86	0.82
	10.- TOTAL NITROGEN%	0.14	0.11	0.08	0.07	0.07	0.07
	12.- POTASSIUM cmol. kg-1	0.31	0.12	0.08	0.09	0.08	0.08
	13.- CALCIUM cmol. kg-1	15.3	13.8	12	11.6	14.4	11.3
	14.- MAGNESIUM cmol. kg-1	3.9	3.1	2.6	4	8.3	6.7
	16.- Relation Ca / Mg	0.34	0.52	0.46	0.36	0.57	0.56
ACIDITY							
	35.- CIC cmol.(+)kg-1	3.9	4.5	4.7	2.9	1.7	1.7
	35.- CIC cmol.kg-1	20.13	17.71	15.46	15.38	23.55	20.94



Laboratory Analysis for Soil Profiles



Municipio: 169

Módulo: 3 Submódulo: 1

IDUEG: (31032) 1690301032

Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
	1.- HUMIDITY %	20.99	19.47	18.19	20.07		
	7.- pH IN WATER (1:2)	5.57	6.22	6.84	6.92		
	8.- ORGANIC MATTER %	1.95	1.34	0.65	0.43		
	9.- RESERVE OF CARBON	1.13	0.78	0.38	0.25		
	10.- TOTAL NITROGEN%	0.10	0.07	0.03	0.02		
	12.- POTASSIUM cmol. kg-1	0.097	0.096	0.098	0.098		
	13.- CALCIUM cmol. kg-1	15.10	17.3	17.1	13.3		
	14.- MAGNESIUM cmol. kg-1	6.37	6.9	6.4	11.3		
	16.- Relation Ca / Mg	0.33	0.52	0.31	0.83		
ACIDITY							
	35.- CIC cmol.(+)kg-1	2.4	2.5	2.7	1.2		
	35.- CIC cmol.kg-1	22.59	25.83	24.61	26.11		



Laboratory Analysis for Soil Profiles



Municipio: 169

Módulo: 3 Submódulo: 1

IDUEG: (31037) 1690301037

Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
	1.- HUMIDITY %	23.81	17.51	19.96	15.25	16.86	18.29
	7.- pH IN WATER (1:2)	6.32	7.35	7.68	7.87	7.89	7.79
	8.- ORGANIC MATTER %	3.83	2.76	1015	1.55	1.48	1.41
	9.- RESERVE OF CARBON	2.22	1.6	1.25	0.9	0.86	0.82
	10.- TOTAL NITROGEN%	0.19	0.14	0.11	0.08	0.07	0.07
	12.- POTASSIUM cmol. kg-1	0.8	1.63	7.36	6.36	1.31	1.31
	13.- CALCIUM cmol. kg-1	21	17.6	15.2	13.5	13.2	13.2
	14.- MAGNESIUM cmol. kg-1	6.9	14.1	7.7	9.4	8.8	6
	16.- Relation Ca / Mg	0.4					
ACIDITY							
	35.- CIC cmol.(+)kg-1	3.1	1.2	2	1.4	1.5	2.2
	35.- CIC cmol.kg-1	29.75	104.0216	106.8911	132.7172	125.5433	111.1955



Laboratory Analysis for Soil Profiles



Municipio: 169

Módulo: 3 Submódulo: 1

IDUEG: (31040) 1690301040

Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
	1.- HUMIDITY %	19.15	20.91	17.8	5.41	2.48	5.35
	7.- pH IN WATER (1:2)	6.04	6.27	5.87	5.88	6.11	5.93
	8.- ORGANIC MATTER %	2.49	1.68	1.55	1.48	1.48	0.71
	9.- RESERVE OF CARBON	1.44	0.98	0.9	0.86	0.86	0.41
	10.- TOTAL NITROGEN%	0.12	0.08	0.08	0.07	0.07	0.04
	12.- POTASSIUM cmol. kg-1	0.14	0.08	0.08	0.06	0.06	0.04
	13.- CALCIUM cmol. kg-1	12.8	11.3	8.8	5.4	3.4	3.3
	14.- MAGNESIUM cmol. kg-1	4.7	4.3	4.7	1.4	1.1	1
	16.- Relation Ca / Mg	0.44	0.51	0.37	0.23	0.26	0.25
ACIDITY							
	35.- CIC cmol.(+)kg-1	2.7	2.6	1.9	4	3	3.3
	35.- CIC cmol.kg-1	18.88	17.12	14.83	8.45	5.57	5.53



Laboratory Analysis for Soil Profiles



Municipio: 169

Módulo: 3 Submódulo: 1

IDUEG: (31042) 1690301042

Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
	1.- HUMIDITY %	21.66	17.92	16.09	17.26	19.3	18.82
	7.- pH IN WATER (1:2)	5.75	5.9	6.42	6.72	6.9	6.94
	8.- ORGANIC MATTER %	2.82	2.22	0.74	0.61	0.47	0.27
	9.- RESERVE OF CARBON	1.64	1.29	0.11	0.35	0.27	0.02
	10.- TOTAL NITROGEN%	0.74	0.43	0.04	0.03	0.02	0.01
	12.- POTASSIUM cmol. kg-1	0.13	0.13	0.05	0.05	0.06	0.07
	13.- CALCIUM cmol. kg-1	13.7	11.7	10.3	10.6	11.2	11.32
	14.- MAGNESIUM cmol. kg-1	4	5	3.8	3.9	3.3	3.5
	16.- Relation Ca / Mg	0.35	0.25	0.26	0.38	0.41	0.43
ACIDITY							
	35.- CIC cmol.(+)kg-1	3.4	2.3	2.7	2.7	3.4	3.23
	35.- CIC cmol.kg-1	19.26	18.25	16.13	16.09	20.41	18.67



Laboratory Analysis for Soil Profiles



Municipio: 169

Módulo: 3 Submódulo: 1

IDUEG: (31046) 1690301046

Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
	1.- HUMIDITY %	16.06	13.41	23.81	23.33		
	7.- pH IN WATER (1:2)	5.4	6.08	6.4	6.53		
	8.- ORGANIC MATTER %	3.16	1.68	1.14	0.81		
	9.- RESERVE OF CARBON	1.83	0.98	0.66	0.47		
	10.- TOTAL NITROGEN%	0.16	0.08	0.06	0.04		
	12.- POTASSIUM cmol. kg-1	0.16	0.14	0.08	0.14		
	13.- CALCIUM cmol. kg-1	14.2	11.9	10.4	11.8		
	14.- MAGNESIUM cmol. kg-1	5	8.6	23	10.9		
	16.- Relation Ca / Mg	0.62	0.75	0.53	0.61		
ACIDITY							
	35.- CIC cmol.(+)kg-1	2.9	1.4	0.5	1.1		
	35.- CIC cmol.kg-1	21.51	23.42	37.56	25.98		



Laboratory Analysis for Soil Profiles



Municipio: 169

Módulo: 3 Submódulo: 2

IDUEG: (32001) 1690302001

Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
	1.- HUMIDITY %	24.16	23.85				
	7.- pH IN WATER (1:2)	6.51	6.65				
	8.- ORGANIC MATTER %	3.29	2.19				
	9.- RESERVE OF CARBON	1.91	0.8				
	10.- TOTAL NITROGEN%	0.16	0.11				
	12.- POTASSIUM cmol. kg-1	0.15	0.13				
	13.- CALCIUM cmol. kg-1	14.82	15.62				
	14.- MAGNESIUM cmol. kg-1	7.33	7.84				
	16.- Relation Ca / Mg	1.49	1.42				
ACIDITY							
	35.- CIC cmol.(+)kg-1	2.02	1.99				
	35.- CIC cmol.kg-1	24.89	26.55				



Laboratory Analysis for Soil Profiles



Municipio: 169

Módulo: 3 Submódulo: 1

IDUEG: (32055) 1690302055

Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
	1.- HUMIDITY %	16.96	15.7	17.25	17.69	17.78	
	7.- pH IN WATER (1:2)	6.4	6.92	7.25	7.35	7.38	
	8.- ORGANIC MATTER %	3.5	1.95	1.14	0.87	0.87	
	9.- RESERVE OF CARBON	2.03	1.13	0.66	0.51	0.51	
	10.- TOTAL NITROGEN%	0.07	0.1	0.06	0.04	0.04	
	12.- POTASSIUM cmol. kg-1	0.13	0.07	0.27	0.16	0.27	
	13.- CALCIUM cmol. kg-1	21.8	13.9	13.3	12.5	9.6	
	14.- MAGNESIUM cmol. kg-1	8.4	13.6	7.1	7.2	8.9	
	16.- Relation Ca / Mg	1.31	1.25				
ACIDITY							
	35.- CIC cmol.(+)kg-1	2.6	1	1.9	1.7	1.1	
	35.- CIC cmol.kg-1	34.44	61.27	149.2171	123.3911	91.10853	



Laboratory Analysis for Soil Profiles



Municipio: 169

Módulo: 3 Submódulo: 1

IDUEG: (32057) 1690302057

Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
	1.- HUMIDITY %	23.17	23.5	20.29	19.55	28.3	
	7.- pH IN WATER (1:2)	5.63	6.38	6.46	6.45	6.71	
	8.- ORGANIC MATTER %	3.97	1.82	1.75	1.17	1.17	
	9.- RESERVE OF CARBON	2.3	1.05	1.01	0.66	0.66	
	10.- TOTAL NITROGEN%	0.2	0.09	0.09	0.06	0.66	
	12.- POTASSIUM cmol. kg-1	0.15	0.14	0.09	0.1	0.98	
	13.- CALCIUM cmol. kg-1	24.6	11.3	12.7	13.5	12.3	
	14.- MAGNESIUM cmol. kg-1	13.5	6	8	7	8.3	
	16.- Relation Ca / Mg	1.02	0.64	0.64	0.59	0.53	
ACIDITY							
	35.- CIC cmol.(+)kg-1	1.8	1.9	1.6	1.9	1.5	
	35.- CIC cmol.kg-1	41.56	21.12	24.58	23.33	24.97	



Municipio: 169

Módulo: 3 Submódulo: 1

IDUEG: (32065) 1690302065



Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
	1.- HUMIDITY %	22.27	21.92	18.98	22.4	23.59	
	7.- pH IN WATER (1:2)	5.67	5.96	6.55	6.77	6.94	
	8.- ORGANIC MATTER %	4.03	2.55	1.34	0.94	0.75	
	9.- RESERVE OF CARBON	2.34	1.48	0.78	0.55	0.43	
	10.- TOTAL NITROGEN%	0.2	0.13	0.07	0.05	0.04	
	12.- POTASSIUM cmol. kg-1	0.27	0.14	0.1	0.1	0.35	
	13.- CALCIUM cmol. kg-1	13.2	14.7	16.6	15.9	12.2	
	14.- MAGNESIUM cmol. kg-1	8	6.4	7.8	9.1	7.2	
	16.- Relation Ca / Mg	0.94	1.13	1.16	0.94	0.84	
ACIDITY							
	35.- CIC cmol.(+)kg-1	1.7	2.3	2.1	1.7	1.7	
	35.- CIC cmol.kg-1	23.41	23.78	26.91	28.05	22.14	



Municipio: 169

Módulo: 3 Submódulo: 1

IDUEG: (32078) 1690302078



Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
	1.- HUMIDITY %	18.79	19.48	20.19	20.64		
	7.- pH IN WATER (1:2)	5.95	6.32	6.46	6.52		
	8.- ORGANIC MATTER %	2.62	1.68	1.48	0.87		
	9.- RESERVE OF CARBON	1.52	0.97	0.86	0.51		
	10.- TOTAL NITROGEN%	0.13	0.08	0.07	0.04		
	12.- POTASSIUM cmol. kg-1	0.28	0.19	0.14	0.08		
	13.- CALCIUM cmol. kg-1	12.6	13.59	15.2	14		
	14.- MAGNESIUM cmol. kg-1	5.4	5.2	5.8	5.3		
	16.- Relation Ca / Mg	0.42	0.47	0.48	0.49		
ACIDITY							
	35.- CIC cmol.(+)kg-1	2.4	2.6	2.6	2.7		
	35.- CIC cmol.kg-1	20.21	21.62	22.97	21.85		



Municipio: 169

Módulo: 3 Submódulo: 1

IDUEG: (32081) 1690302081



Concept	Element and Measurement Unit	Result Layer1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
	7.- pH IN WATER (1:2)	6.45	6.8	6.67	6.87		
	8.- ORGANIC MATTER %	2.82	1.28	1.01	0.61		
	9.- RESERVE OF CARBON	1.64	0.74	0.59	0.35		
	10.- TOTAL NITROGEN%	0.14	0.06	0.05	0.03		
	12.- POTASSIUM cmol. kg-1	0.13	0.14	0.08	0.08		
	13.- CALCIUM cmol. kg-1	19.9	15.5	13.1	11.4		
	14.- MAGNESIUM cmol. kg-1	7.8	8.7	8	10.2		
	16.- Relation Ca / Mg	0.91	1.02	1.49	1.41		
		2.5	1.8	1.6	1.1		
ACIDITY							
	35.- CIC cmol.(+)kg-1						
	35.- CIC cmol.kg-1	31.86	27.79	25.81	24.68		



Municipio: 169

Módulo: 3 Submódulo: 1

IDUEG: (32092) 1690302092



Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6	Resultado Layer 7
FERTILITY								
	1.- HUMIDITY %	21.44	19.1	16.11	18.47	3.91	8.82	2.39
	7.- pH IN WATER (1:2)	5.82	6.05	6.4	6.45	6.41	6.43	6.34
	8.- ORGANIC MATTER %	2.15	1.34	0.87	0.87	0.87	0.67	0.67
	9.- RESERVE OF CARBON	1.25	0.78	0.51	0.51	0.39	0.39	0.39
	10.- TOTAL NITROGEN%	0.11	0.07	0.04	0.04	0.03	0.03	0.03
	12.- POTASSIUM cmol. kg-1	0.15	0.10	0.07	0.09	0.09	0.08	0.05
	13.- CALCIUM cmol. kg-1	13.4	13.1	12.1	10.1	7.8	10.5	6.4
	14.- MAGNESIUM cmol. kg-1	7.3	3.5	1.6	5.1	1.2	2.2	0.6
	16.- Relation Ca / Mg	0.31	0.32	0.33	0.3	0.27	0.26	0.26
		1.8	3.8	7.4	2	6.5	4.8	11
ACIDITY								
	35.- CIC cmol.(+)kg-1							
	35.- CIC cmol.kg-1	22.48	16.94	15.89	17.35	11.79	15.12	9.45



Laboratory Analysis for Soil Profiles

Municipio: 207

Módulo: 4 Submódulo: 1

IDUEG: (41001) 2070401001



Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
	1.- HUMIDITY %	8.95	10.39	14.82	10.11	2.05	
	7.- pH IN WATER (1:2)	4.6	4.86	4.89	5.21	5.61	
	8.- ORGANIC MATTER %	1.01	0.61	0.54	0.34	0.2	
	9.- RESERVE OF CARBON	0.59	0.35	0.31	0.2	0.12	
	10.- TOTAL NITROGEN%	0.05	0.03	0.03	0.02	0.01	
	12.- POTASSIUM cmol. kg-1	0.05	0.05	0.05	0.05	0.05	
	13.- CALCIUM cmol. kg-1	3.2	2.7	2.1	2.2	2.3	
	14.- MAGNESIUM cmol. kg-1	1.1	1.1	1.3	2.8	5	
	15.-SODIUM cmol. kg-1*	0.24	0.24	0.18	0.21	0.24	
	16.- Relation Ca / Mg	3	2.5	1.6	0.8	0.05	
ACIDITY							
	35.- CIC cmol.kg-1	7.63	8.91	6.23	8.45	9.89	



Laboratory Analysis for Soil Profiles

Municipio: 207

Módulo: 4 Submódulo: 2

IDUEG: (42003) 2070402003



Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
	1.- HUMIDITY %	20.39	19.07	21.21	21.08	11.4	10.18
	7.- pH IN WATER (1:2)	5.44	6.61	6.84	7.19	7.54	8.44
	8.- ORGANIC MATTER %	2.76	2.15	2.08	1.88	1.34	0.52
	9.- RESERVE OF CARBON	1.6	1.25	1.21	1.09	0.78	0.3
	10.- TOTAL NITROGEN%	0.14	0.11	0.1	0.09	0.07	0.03
	12.- POTASSIUM cmol. kg-1	0.09	0.08	0.07	6.6	7.06	7.12
	13.- CALCIUM cmol. kg-1	10.2	11.6	15.18	20.2	21.13	22.31
	14.- MAGNESIUM cmol. kg-1	5.1	7.6	8.9	12.7	13.19	14.18
	15.-SODIUM cmol. kg-1*	0.29	0.36	0.47			
	16.- Relation Ca / Mg	2	1.6	1.7	1.6	1.6	1.6
ACIDITY							
	35.- CIC cmol.kg-1	18.42	24.68	28.74	55.95642	175.7606	111.1955



Municipio: 207

Módulo: 4 Submódulo: 2

IDUEG: (42006) 207042006



Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
	1.- HUMIDITY %	13.61	15.85	14.84	14.52	27.1	
	7.- pH IN WATER (1:2)	4.83	6.14	5.71	5.43	5.01	
	8.- ORGANIC MATTER %	2.82	2.22	1.68	1.28	0.47	
	9.- RESERVE OF CARBON	1.64	1.29	0.98	0.74	0.27	
	10.- TOTAL NITROGEN%	0.14	0.11	0.08	0.06	0.02	
	12.- POTASSIUM cmol. kg-1	0.07	0.08	0.16	0.14	0.16	
	13.- CALCIUM cmol. kg-1	12.5	9.3	14.1	9.9	24.9	
	14.- MAGNESIUM cmol. kg-1	8.1	15.4	10	5.5	7.4	
	15.-SODIUM cmol. kg-1*	0.4	0.55	0.52	0.51	0.47	
	16.- Relation Ca / Mg	1.5	0.6	1.4	1.8	3.4	
ACIDITY							
	35.- CIC cmol.kg-1	23.23	28.95	26.41	19.75	35.52	



Municipio: 174

Módulo: 4 Submódulo: 6

IDUEG: (46012) 1740406012



Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
	1.- HUMIDITY %	10.71	12.08	18.53	12.92	11.41	11.58
	7.- pH IN WATER (1:2)	6	6.52	7.04	7.51	7.08	6.98
	8.- ORGANIC MATTER %	1.02	0.83	0.31	0.11	0.05	0.05
	9.- RESERVE OF CARBON	0.59	0.48	0.18	0.06	0.03	0.03
	10.- TOTAL NITROGEN%	0.05	0.04	0.02	0.01	0.002	0.02
	12.- POTASSIUM cmol. kg-1	0.18	0.06	0.14	0.14	0.14	0.14
	13.- CALCIUM cmol. kg-1	13.9	8.4	17.7	16.9	17.6	17.4
	14.- MAGNESIUM cmol. kg-1	12.2	6.8	10.2	10.7	6	5.98
	15.-SODIUM cmol. kg-1*	0.3	0.3				
	16.- Relation Ca / Mg	1.1	1.2	1.7	1.6	2.9	2.9
ACIDITY							
	35.- CIC cmol.kg-1	29.41	17.95	125.5433	70.30422	145.6302	100.4346



Laboratory Analysis for Soil Profiles



Municipio: 174

Módulo: 4 Submódulo: 7

IDUEG: (47005) 1740407005

Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
	1.- HUMIDITY %	9.65	15.4	22.68	20.69	12.28	14.56
	7.- pH IN WATER (1:2)	5.78	6.45	6.54	6.6	6.56	6.85
	8.- ORGANIC MATTER %	2.15	1.21	0.47	0.4	0.4	0.27
	9.- RESERVE OF CARBON	1.25	0.7	0.27	0.23	0.23	0.16
	10.- TOTAL NITROGEN%	0.11	0.06	0.02	0.02	0.02	0.01
	12.- POTASSIUM cmol. kg-1	0.16	0.1	0.08	0.06	0.05	0.04
	13.- CALCIUM cmol. kg-1	15.2	21.3	17.9	12.8	13.9	13.4
	14.- MAGNESIUM cmol. kg-1	4.9	7.8	7.1	7.9	6.5	6.3
	15.-SODIUM cmol. kg-1*	0.28	0.33	0.4	0.27	0.38	0.3
	16.- Relation Ca / Mg	3.1	2.7	2.5	1.6	2.1	2.1
ACIDITY							
	35.- ALUMINO cmol.kg-1	25.48	32.62	28.57	24.91	22.36	22.05



Laboratory Analysis for Soil Profiles



Municipio: 174

Módulo: 4 Submódulo: 7

IDUEG: (47007) 1740407007

Concept	Element and Measurement Unit	Result Layer 1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6	Resultado Layer 7
FERTILITY								
	1.- HUMIDITY %	14.95	20.56	16.53	18.63	18.7	13.27	7.91
	7.- pH IN WATER (1:2)	5.66	6.2	6.45	6.51	6.41	6.73	6.68
	8.- ORGANIC MATTER %	2.82	2.15	1.61	1.48	1.48	1.14	1.14
	9.- RESERVE OF CARBON	1.64	1.25	0.94	0.86	0.86	0.66	0.66
	10.- TOTAL NITROGEN%	0.14	0.11	0.08	0.07	0.07	0.06	0.06
	12.- POTASSIUM cmol. kg-1	0.25	0.08	0.05	0.05	0.08	0.08	0.08
	13.- CALCIUM cmol. kg-1	10.5	14.5	13.5	11.9	12.4	5	7.5
	14.- MAGNESIUM cmol. kg-1	7.8	6.6	5	7.8	6.8	6.9	3.5
	15.-SODIUM cmol. kg-1*	0.35	0.29	0.33	0.3	0.76	0.31	0.35
	16.- Relation Ca / Mg	1.3	2.2	2.7	1.5	1.78	0.7	2.1
ACIDITY								
	35.- CIC cmol.kg-1	21.23	24.78	20.59	22.42	22.34	15.46	



Laboratory Analysis for Soil Profiles



Municipio: 174

Módulo: 4 Submódulo: 8

IDUEG: (48004) 1740408004

Concept	Element and Measurement Unit	Result Layer1	Result Layer 2	Result Layer 3	Result Layer 4	Result Layer 5	Result Layer 6
FERTILITY							
	1.- HUMIDITY %	15.68	15.17	6.91	4.44	8.18	
	7.- pH IN WATER (1:2)	5.66	6.41	6.32	6.3	6.15	
	8.- ORGANIC MATTER %	1.95	0.74	0.47	0.4	0.4	
	9.- RESERVE OF CARBON	1.13	0.43	0.27	0.23	0.23	
	10.- TOTAL NITROGEN%	0.1	0.04	0.02	0.02	0.02	
	12.- POTASSIUM cmol. kg-1	0.14	0.08	0.07	0.06	0.06	
	13.- CALCIUM cmol. kg-1	11.5	12.6	11.8	7.4	8.6	
	14.- MAGNESIUM cmol. kg-1	3.9	6.6	6.4	8	4.2	
	15.-SODIUM cmol. kg-1*	0.24	0.41	0.41	0.41	0.39	
	16.- Relation Ca / Mg	2.9	1.9	1.8	0.9	2	
ACIDITY							
	35.- CIC cmol.kg-1	18.95	22.44	21.13	18.52	16.95	

