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Delta Organic Soil Salinity and Nutrient Status Study
Report of Laboratory Analyses

University of California
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in cooperation with

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Department of Water Resources
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DELTA ORGANIC SOIL SALINITY & NUTRIENT STATUS STUDY

Second-Year Summary Report of Laboratory Analysis

J. L. Meyer - Alan Carlton*

PURPOSE

This study, which began in 1973, was designed to investigate the salinity status of soils in the Delta. Measurements were made of the soil profile distribution of salts and nutrients and their movement at selected sites in the organic soils of the San Joaquin-Sacramento Delta.

The major crops and the water management practices of the Delta including sub-irrigation, furrow, sprinkler and flooding were observed.

In 1973, sites for study were on Bacon and Staten Islands; Terminous, Rio Blanco and Ringe Tracts. During 1974, the number of experimental sites on these islands and tracts was decreased from 22 sites to 8 sites.

In 1974, a new site was selected on Sherman Island to make a total of nine study sites for the year. More detailed examinations of soils, soil solutions, incoming irrigation water, and drainage waters were conducted at the nine remaining sites for the 1974 study than was possible in 1973.

LITERATURE BACKGROUND

Salinity

A major goal of this investigation is to determine similarities or lack of similarity of peat soils to mineral soil concerning concepts of salt movement. Campbell and Richards[1] concluded in their studies in 1955 that the moisture retaining properties and particularly the moisture transmitting properties of peat soils appear to be similar to those of mineral soils.

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[1] R. B. Campbell & L. A. Richards - AGRONOMY JOURNAL, 1955, Page 582, Some Moisture and Salinity Relationships in Peat Soils.

They further state, the electrical conductivities (EC) of the saturation extract of peats appear to be as well suited for appraising the salinity of peat soils as it is for mineral soils.

Sherman Island was added this year to the study area because of the belief that the Western Delta is more saline and also because of previous research conducted in this area of the Delta. L. D. Doneen[2], in his lengthy field and laboratory study, "Salinity Criteria of Agricultural Waters for Peaty and Sedimentary Soils of the Lower Delta," found considerable salinity in surface peats in fields studied on Sherman Island.

Doneen found surface accumulation of salts (EC_e) was high. Ground water samples and deep soil samples did not reveal the high salinity that surface soils did. Field leaching was found to be difficult unless combined with winter rains. The leaching of laboratory soil columns seemed to indicate difficulty with salt removal and large quantities of water were needed to move salt in a peat soil.

A recalculation of their laboratory work based on expected pore volumes reveals that a soil pore volume leached through a peat soil removes up to 50 percent of soluble salts as is often the case in mineral soils. It appears then that much of the high leaching requirements in Delta soils is a case of filling pore spaces (often requiring 200 percent water on a weight basis) to accomplish leaching comparable to mineral soils.

Good salinity removal in surface soils from field leaching was found at sites 21, 22 and 23 in this study[3] (1973).

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2 L. D. Doneen, Department of Water Resources Report - Department of Irrigation - University of California, Davis.

3 J. L. Meyer & Alan Carlton, 1974, Results of Organic Soil Salinity and Nutrient Status Study.

Although the organic soils of the Delta tend to be high in nitrate, researchers have reported low NO_3^--N in the Delta drainage waters. B. D. Meek, et al[4], reports low levels of NO_3^--N from nitrogen transformations in a peat soil column.

Meek[5] further reports that in high water table conditions denitrification takes place rapidly at and even several inches above a water table. In view of Meek's findings, it is not surprising to find low NO_3^--N in Delta waters.

SITES AND HISTORY

Nine sites were used for the 1974 study. The following are a listing of sites, crops and a brief crop and irrigation history at each location. The sites of 1974 carry the same numbers as in 1973.

SITE	73 CROP	74 CROP	LOCATION	IRRIGATION	CROP HISTORY
1	Asparagus	Asparagus	Bacon Is.	Winter Flooded	Aspargus (since 1966)
2	Asparagus	Asparagus	Terminous	Sprinkled 71-72 Subirrigated 73-74	Corn - 70 Barley - 69 Tomatoes - 68
4	Weeds	Weeds	Terminous Y	Nonirrigated	Virgin Peat Soil
5	Potatoes	Potatoes	Bacon Is.	Subirrigated (by spud ditch) Flooded Winter 73-74	Potatoes (since 1971)
7	Corn	Corn	Terminous	Subirrigated spud ditch	Corn - 73 Safflower-72 Corn - 71 Corn - 70
12	Alfalfa	Alfalfa	Staten Is.	Sprinkled since 1968 Flooded 70-71	Beets - 67 Wheat - 66 Corn - 65

4 B. D. Meek, et al - SOIL SCIENCE PROCEEDINGS, Vol. 34, 1970, No. 2 - Nitrate Transformation in a Column with Controlled Water Table.

5. B. D. Meek, et al, - SOIL SCIENCE PROCEEDINGS, Vol. 33, 1969, No. 4 - Applied Nitrogen Losses in Relation to Oxygen Status of Soils.

SITE	73 CROP	74 CROP	LOCATION	IRRIGATION	CROP HISTORY
13	Corn	Corn	Rindge	Subirrigated (spud ditch)	Corn - 68-74
22	Barley	Corn	Staten Is.	Subirrigated (spud ditch)	

1973 Leaching Trials

METHODS

Soil samples were collected at each site at the beginning of the 1974 crop season and after crop harvest. Samples were obtained at six-inch intervals into the water tables at all sites and to nine feet at three sites.

Soil analyses were determined in the San Joaquin County Cooperative Extension Laboratory on saturation extracts.

After initial soil samples were obtained, soil solution extraction probes were placed under the crops at six-inch increments of depth.

Soil solutions from the extraction probes were obtained throughout the growing season at approximately weekly intervals and were analyzed for the same constituents as the soil samples. The nutrients, nitrogen, phosphorus and potassium were analyzed on most of the extracted soil solutions by the University of California, Davis, Cooperative Extension Laboratory. Water table depths were monitored and irrigation and drainage water analyses made.

Analyses were for pH, EC, $Ca^{++}+Mg^{++}$, CO_3^-, Cl^-, NO_3^--N, NH_4^+-N, PO_4^-, HCO_3^-, and K^+. Standard University of California Cooperative Extension methods were used. In the following discussion, the electrical conductivity of saturated extracts are termed EC_e while electrical conductivity of solutions from soil solution extraction probes are termed EC_{sw}. They are stated in millimhos/cm (mmho).

The high pH and HCO_3^- analyses from suction cups (extraction probes) should be ignored as these are presumed due to dissolution of small amounts of lime from the cups. Other analyses would be unaffected.

The values for EC_e and EC_{sw} do not necessarily correlate closely because they measure somewhat different fractions of the soil moisture. These studies are a case in point and it is not meaningful to directly compare these two analyses of a profile at different times. However, it is useful for example to trace the changes in effective salinity with time by following changes in the EC_{sw}.

RESULTS AND CONCLUSIONS

The data referred to herein is contained in the supplemental titled, "1974 Report - Organic Soil Salinity and Nutrient Status Study, Report of Laboratory Analysis."

These studies indicate that the soil salinity profiles are extremely complex in the Delta. The large number of crops, soils, water and management schemes are each variables and interact with each other. Evaluation of one variable, water quality as it affects soil salinity, is difficult.

At the end of this two-year evaluation of the salinity status of the Delta some generalizations can be inferred.

1. The present salinity levels vary (quantities and soil profile distribution) greatly in the Delta.
2. Salinity in the organic soil study area was generally low, except Sherman Island, and in a range of EC_e 2-4 mmho.
3. The surface 6 to 18 inches of soil shows salinity accumulations under all forms of subirrigation. Salt is unevenly distributed in soils by the moving water table and the evapo-transpiration effect.
4. A given water management practice and cropping system, over a period of years, appears to produce a salinity profile unique to the particular management practice.
5. Sprinkler irrigation over a period of six years (Staten Site XII) has resulted in the lowest salinity level of any of the sites examined in this study.

6. Flooding for leaching purposes can remove large quantities of salts and is most effective near operating drains.

7. Salts moved during flooding are affected by drainage conditions surrounding and in the field being leached. Salts do move in peat soils upward with the water table (similar to mineral soils). In a virgin peat, nonirrigated, but with growing plants above a water table, salts are moved upward (by evapo-transpiration).

8. At the end of the 1974 season a brief attempt was made to determine the salinity of waters underlying the water table. Depths of six to eight feet were sampled at three locations by means of driven extraction probes (Set V of tabulated data). The EC_{sw} varied from 0.68 to 4.3 and in one case increased with depth and in another decreased. No general conclusion can be drawn from this small experiment; but it indicated deep waters, one of variable concentration and not all are high in salts.

9. Considering the Delta as exemplified by this year's nine sites, the ratio of EC to Cl^- varies so widely (0.13 to 0.70 for whole profile average) that although Cl^- may be an adequate measure of salinity in the western Delta, it cannot be substituted for more direct measure of salinity (such as EC) when considering the Delta as a whole.

10. In addition to the EC-Cl^- ratio (a measure of the anion quality of the water) varying from place to place in the Delta, an examination of the data shows also that it will vary considerably from one part of the profile to another (e.g., Bacon Site VI and Staten Site XII at end of season; at Rindge Site XIII throughout the season; and at Staten Site XX at start of season). The ratio might increase with depth or decrease, depending on location. Also, at some of the locations this EC-Cl^- ratio is changing with progress of the season (e.g., Terminous Sites VIII and IX, ground water at six feet; Staten Site XII.

Refer to Table I.). The inference from these observations is that there is not a common source of salts, but rather two or more sources combining in various ways.

From this study and the available literature, it appears organic soils display characteristics similar to mineral soils when the volume of water needed to fill a peat soil is considered.

Water table depths and salinity content drastically affect salt management in the Delta organic soils. This factor, together with irrigation water quality and crop management are critical to an understanding of expected salinity profiles and viable management practices.

Table I.

Showing Magnitude and Variability of EC_e/Cl^- -- EC_{sw}/Cl^- Ratio

ISLAND	SITE	AVERAGE EC/Cl⁻	WHOLE PROFILE AVERAGE RANGE	INDIVIDUAL SAMPLE RANGE
Bacon	1	.40	.36 - .45	.24 - .70
Bacon	6	.35	.25 - .39	.19 - .54
Terminous	2	.60	.51 - .70	.26 - .96
Terminous	4	.27	.25 - .29	.17 - .40
Terminous	8-9	.42	.27 - .53	.18 - .85
Staten	12	.18 .41	.17 - .41	.10 - .75
Staten	20	.39	.32 - .49	.24 - .78
Rindge	13	.16	.14 - .19	.10 - .38
Sherman	23	.14	.13 - .14	.09 - .18

REFERENCE LITERATURE

Campbell, R. B. & L. A. Richards, Some Moisture and Salinity Relationships in Peat Soils, AGRONOMY JOURNAL, Pg. 582, 1955.

Doneen, L. D., Salinity Criteria of Agricultural Waters for Peaty and Sedimentary Soils of the Lower Delta, DEPARTMENT OF WATER RESOURCES REPORT, Department of Irrigation, University of California, Davis.

Meek, B. D., et al, Applied Nitrogen Losses in Relation to Oxygen Status of Soils, SOIL SCIENCE PROCEEDINGS, Vol. 33, No. 4, 1969.

Meek, B. D., et al, Nitrate Transformation in a Column with Controlled Water Table, SOIL SCIENCE PROCEEDINGS, Vol. 34, No. 2, 1970.

Meyer, J. L. & Alan Carlton, Results of Organic Soil Salinity and Nutrient Status Study, 1974.

BACON ISLAND ASPARAGUS
- Spud Ditch -

Site 1

Date	Depth Inches	EC_e (mmho)	Cl^- (ME/L)	Water Table
		- Mid Winter -		
3/13/74	0-6	0.50	0.1	
	6-12	1.20	0.2	
Soil	12-18	1.42	4.2	
	18-24	1.15	2.0	
	24-30	4.90	7.0	
	30-36	4.00	6.6	
	36-42	1.50	3.6	
	42-48	1.45	3.6	
	48-54	1.80	4.0	
	54-60	2.19	3.2	
		- Beginning Season -		
6/5/74	0-6	1.20	5.0	
	6-12	1.48	2.4	
Soil	12-18	1.30	4.4	
	18-24	1.48	3.4	
	24-30	2.50	4.4	
	30-36	3.00	11.2	
	36-42	3.64	10.8	
	42-48	4.54	13.6	
	48-54	5.00	15.0	
		EC_{sw}		
6/26/74	24	2.68	8.2	60.0"
	36	4.80	10.0	
	48	3.40	8.4	
	60	3.60	11.6	
7/10/74	24	3.10	10.0	65.0"
	36	4.00	11.0	
Soil	48	3.28	8.2	
Water	60	3.25	11.0	
7/31/74	24	-	-	63.0"
	36	3.38	8.4	
	38	4.30	10.8	
	60	3.80	11.4	
8/14/74	24	2.08	8.2	69.0"
	36	4.05	9.0	
	48	4.95	10.2	
	60	-	-	
		- End Season -		
		EC_e		
8/19/74	0-6	1.80	16.0	
	6-12	1.62	4.8	
Soil	12-18	1.10	3.4	
	18-24	1.03	3.8	
	24-30	3.20	6.4	
	30-36	3.20	8.0	
	36-42	3.30	9.0	
	42-48	3.60	10.2	
	48-54	4.00	11.0	
	54-60	5.00	14.2	

TERMINOUS ASPARAGUS
- No Irrigation -

Site 2

Date	Depth Inches	EC_e (mmho)	Cl^- (ME/L)	Water Table
		- Early Winter -		
11/28/73	0-6	0.70	1.6	
	6-12	0.68	2.6	
Soil	12-18	1.12	1.8	
	18-24	0.38	1.0	
	24-30	0.80	2.0	
	30-36	0.70	1.6	
	36-42	0.65	1.2	
	42-48	0.48	ns	
	48-54	0.54	ns	
		- Mid Winter -		
1/25/74	0-6	0.41	1.0	
	6-12	0.46	1.6	
Soil	12-18	2.00	3.0	
	18-24	4.00	2.8	
	24-30	2.40	3.2	
	30-36	0.96	1.0	
	36-42	0.69	1.2	
	42-48	0.50	1.0	
	48-54	0.48	1.0	
		EC_{sw}		
6/27/74	27	1.80	2.8	38.0"
	33	1.56	2.0	
	39	-	-	
	45	-	-	
	51	-	-	
7/11/74	27	1.80	2.2	54.0" (mud)
	33	1.30	1.8	
Soil Water	39	1.05	2.0	
	45	1.00	1.4	
	51	0.99	1.6	
8/1/74	27	1.95	3.0	54.0" (mud)
	33	1.35	2.2	
	39	1.10	2.2	
	45	0.70	1.2	
	51	0.52	1.4	
8/16/74	27	1.91	1.2	54.0" (mud)
	33	1.40	1.8	
	39	1.10	1.6	
	45	0.68	-	
	51	0.60	1.4	
		- End Season -		
		EC_e		
9/16/74	0-6	1.54	1.6	
	6-12	1.25	1.4	
Soil	12-18	2.20	3.0	
	18-24	4.80	5.2	
	24-30	1.30	2.2	
	30-36	0.59	1.8	
	36-42	0.40	0.8	
	42-48	0.40	0.8	
	48-54	0.88	1.0	
	54-60	-	-	

TERMINOUS "Y" VIRGIN PEAT SOIL
- No Irrigation -

Site 4

Date	Depth Inches	EC_e (mmho)	Cl^- (ME/L)	Water Table
		- Mid Winter -		
1/25/74	0-6	0.40	1.2	
	6-12	0.38	2.0	
Soil	12-18	0.60	1.8	
	18-24	1.28	4.2	
	24-30	1.00	2.6	
	30-36	2.20	7.4	
	36-42	3.20	11.0	
	42-48	4.00	16.2	
	48-54	3.70	15.6	
		- Beginning Season -		
		- not taken -		
		EC_{sw}		
7/11/74	42	2.90	7.2	56.0"
	48	1.85	8.0	
Soil	54	1.97	6.6	
Water	60	1.90	8.2	
8/1/74	42	1.40	8.2	57.0"
	48	2.05	8.6	
	54	1.90	8.2	
	60	1.73	8.2	
8/16/74	42	1.90	7.6	59.0"
	48	-	-	
	54	1.90	8.2	
	60	1.80	8.2	
		- End Season -		
		EC_e		
9/18/74	0-6	1.50	6.8	
	6-12	0.70	3.4	
Soil	12-18	0.78	3.4	
	18-24	0.90	3.6	
	24-30	1.80	7.6	
	30-36	2.50	7.5	
	36-42	5.00	14.4	
	42-48	5.80	16.8	
	48-54	6.80	24.4	
	54-60	7.00	27.0	

BACON ISLAND POTATOES
- Spud Ditch Every 12 Rows -

Site 6

Date	Depth Inches	EC_e (mmho)	Cl^- (ME/L)	Water Table
		- Mid Winter -		
2/5/74	0-6	0.25	2.4	
	6-12	0.45	1.4	
Soil	12-18	0.90	3.8	
	18-24	0.70	2.8	
	24-30	1.26	6.8	
Planted	30-36	1.75	6.2	
4/15/74	36-42	1.68	7.2	
		- Beginning Season -		
5/16/74	0-6	3.90	7.2	14.0"
	6-12	1.52	5.8	
Soil	12-18	0.75	2.2	
	18-24	0.53	2.4	
	24-30	1.20	5.4	
	30-36	2.20	~~21.6~~ 10.8	
		EC_{sw}		
5/16/74				14.0"
5/27/74	18	1.65	3.8	12.0"
	6 ft	1.30	5.0	
6/26/74	6	0.71	2.4	38.0"
	12	0.92	2.0	
Soil	18	0.68	2.2	
Water	24	0.61	1.4	
	30	0.60	1.2	
	6 ft	0.60	1.2	
7/10/74	6	-	-	39.0"
	12	-	-	
	18	-	-	
	24	0.60	1.4	
	30	-	-	
	6 ft	0.90	3.0	
		- End Season -		
		EC_e		
9/18/74	0-6	4.36	16.4	
	6-12	2.79	9.0	
Soil	12-18	1.50	5.0	
	18-24	1.90	5.6	
	24-30	1.80	5.8	
	30-36	3.00	7.8	
	36-42	4.00	9.0	
	42-48	4.40	9.8	
	48-54	4.80	10.6	
	54-60	4.60	10.8	

TERMINOUS CORN
- Spud Ditch -

Site 8-9

Date	Depth Inches	EC_e (mmho)	Cl^- (ME/L)	Water Table
		- Mid Winter -		
1/25/74	0-6	0.51	1.0	
	6-12	0.60	1.8	
¼ distance	12-18	0.46	1.0	
from Spud	18-24	0.72	2.2	
Ditch	24-30	0.91	7.4	
	30-36	1.00	2.0	
Soil	36-42	1.00	2.8	
	42-48	0.95	3.2	
	48-54	0.75	2.4	
	54-60	0.70	2.6	
1/25/74	0-6	1.38	3.4	
	6-12	0.77	1.6	
½ distance	12-18	0.82	1.0	
between	18-24	0.92	1.2	
Spud Ditches	24-30	0.85	1.0	
	20-36	1.10	2.4	
Soil	36-42	1.33	4.4	
	42-48	1.00	3.0	
	48-54	0.90	2.6	
	54-60	0.92	3.0	
		- Beginning Season -		
5/16/74	0-6	1.30	7.4	
	6-12	1.75	8.4	
Soil	12-18	0.90	3.8	
	18-24	0.62	2.2	
	24-30	0.75	2.6	
	30-36	1.10	4.2	
	36-42	1.10	3.2	
	42-48	1.20	3.8	
		EC_{sw}		
6/27/74	30	-	-	52.0"
	36	1.60	2.2	
	6 ft	1.60	2.2	
7/11/74	30	3.65	-	24.0" (water in
Soil	36	2.20	-	Spud Ditch)
Water	6 ft	1.45	3.6	
8/1/74	12	3.40	4.8	
	18	1.60	6.2	
	24	1.70	-	
	36	2.38	-	
	6 ft	2.10	6.6	
		- End Season -		
		EC_e		
9/16/74	0-6	2.15	5.2	
	6-12	0.50	1.2	
Soil	12-18	0.60	1.8	
	18-24	1.10	1.8	
	24-30	1.18	0.2	
	30-36	1.38	2.6	
	36-42	1.95	5.4	
	42-48	1.40	3.2	
	48-54	1.00	2.8	

STATEN ISLAND ALFALFA
- Sprinkler Irrigated -

Site 12

Date	Depth Inches	EC_e (mmho)	Cl^- (ME/L)	Water Table
		- Mid Winter -		
2/1/74	0-6	0.36	3.2	
Soil	6-12	0.50	4.0	
	12-18	0.69	4.8	
	18-24	0.55	3.4	
	24-30	0.50	2.6	
	30-36	0.30	1.8	
	36-42	0.28	1.6	
	42-48	0.33	1.6	
	48-54	0.32	1.0	
	54-60	0.27	2.0	
		- Beginning Season -		
5/29/74	0-6	0.35	2.0	
Soil	6-12	0.40	4.0	
	12-18	0.60	3.4	
	18-24	0.51	4.4	
	24-30	0.48	3.0	
	30-36	0.45	3.4	
	36-42	0.35	1.2	
	42-48	0.40	1.6	
		EC_{sw}		
6/25/74	6	-	-	25.0"
	12	0.56	1.4	Irrigation from
	18	0.61	2.6	this ditch.
	24	0.45	1.2	
	30	0.48	1.2	
	36	0.61	1.6	
7/9/74	6	-	-	29.0"
	12	0.68	1.6	
Soil Water	18	0.61	1.0	
	24	0.47	1.0	
	30	0.50	1.2	
	36	0.60	1.4	
7/31/74	6	-	-	23.0"
	12	0.50	1.4	
	18	0.40	1.0	
	24	0.55	1.4	
	30	0.68	1.6	
	36	0.58	1.4	
8/14/74	6	-	-	36.0"
	12	0.61	0.2	
	18	-	-	
	24	0.42	1.4	
	30	0.50	1.0	
	36	0.56	1.4	
		- End Season -		
		EC_e		
9/18/74	0-6	0.45	2.6	
	6-12	0.50	3.0	
Soil	12-18	0.34	1.4	
	18-24	0.35	1.0	
	24-30	-	-	
	30-36	0.24	0.7	
	36-42	0.46	0.9	
	42-48	0.29	0.5	
	48-54	0.28	0.5	
	54-60	0.30	0.4	

RINDGE TRACT CORN
- Spud Ditch -

Site 13

Date	Depth Inches	EC_e (mmho)	Cl^- (ME/L)	Water Table
		- Mid Winter -		
2/1/74	0-6	0.60	1.6	36.0"
	6-12	0.46	1.6	
Soil	12-18	0.98	4.0	
	18-24	2.05	10.4	
	24-30	3.40	22.8	
	30-36	3.60	28.4	
	36-42	6.30	60.0	
	42-48	6.10	53.4	
	48-54	3.60	35.0	
		- Beginning Season -		
5/16/74	0-6	0.85	3.2	36.0"
	6-12	0.95	3.6	
Soil	12-18	1.19	5.9	
	18-24	3.00	18.0	
	24-30	3.20	18.4	
	30-36	6.20	38.6	
	36-42	8.20	68.0	
	42-48	8.00	65.8	
		EC_{sw}		
6/27/74	6	-	-	52.0"
	12	-	-	
	18	-	-	
	24	3.94	26.2	
	30	-	-	
	6 ft	3.15	28.6	
7/11/74	6	4.35	ns	42.0"
rain	12	2.97	21.8	
7/8 & 7/9/74	18	0.78	5.8	
	24	3.90	25.6	
Soil	30	4.20	28.4	
Water	6 ft	3.05	28.2	
8/1/74	6	4.68	24.8	45.0"
	12	4.47	23.2	
	18	1.50	9.4	
	24	3.40	22.0	
	30	3.56	25.8	
	6 ft	2.80	27.6	
8/16/74	6	-	-	56.0"
	12	-	-	
	18	1.45	9.4	
	24	3.20	23.4	
	30	3.20	26.2	
	6 ft	3.10	27.8	
		- End Season -		
		EC_e		
10/4/74	0-6	1.80	8.4	60.0"
	6-12	1.75	8.2	
Soil	12-18	2.10	11.6	
	18-24	2.15	12.0	
	24-30	3.40	25.2	
	30-36	4.10	32.2	
	36-42	5.40	43.8	
	42-48	5.26	45.8	
	48-54	6.80	65.8	

STATEN ISLAND CORN
- Spud Ditch - Flooded Summer 1973 -

Site 20

Date	Depth Inches	EC_e (mmho)	Cl^- (ME/L)	Water Table
		- Beginning Season -		
5/29/74	0-6	1.30	2.0	
	6-12	0.78	1.0	
Soil	12-18	0.70	1.0	
	18-24	0.58	1.0	
	24-30	0.70	1.4	
	30-36	0.60	2.0	
	36-42	0.69	1.7	
	42-48	-	-	
	48-54	1.00	4.2	
	54-60	1.30	5.4	
		EC_{sw}		
6/19/74	18	1.41	-	9.0"
	6 ft	1.51	4.8	
6/25/74	18	-	-	32.5"
	24	1.28	4.6	
	30	1.40	4.4	
	36	1.33	4.2	
	6 ft	1.47	4.8	
7/9/74	18	-	-	42.0"
	24	1.24	2.6	
Soil Water	30	1.25	4.2	
	36	1.30	2.2	
	6 ft	1.45	4.8	
7/31/74	18	-	-	
	24	-	-	
	30	-	-	
	36	-	-	
	6 ft	1.35	4.2	
8/14/74	18	-	-	
	24	1.20	3.0	
	30	1.30	4.0	
	36	1.22	3.4	
	6 ft	1.40	4.2	
		- End Season -		
		EC_e		
9/16/74	0-6	2.55	6.2	
	6-12	1.20	9.2	
Soil	12-18	0.80	2.0	
	18-24	0.82	2.0	
	24-30	0.60	2.4	
	30-36	0.81	3.0	
	36-42	1.40	4.8	
	42-48	2.00	4.8	
	48-50	3.23	6.4	
	54-60	4.46	7.8	

SHERMAN ISLAND CORN
- Furrow -

Site 23

Date	Depth Inches	EC_e (mmho)	Cl^- (ME/L)	Water Table
		- Beginning Season -		
5/29/74	0-6	9.00	67.0	
	6-12	5.80	44.2	
Soil	12-18	4.10	33.0	
	18-24	4.20	38.8	
	24-30	4.00	45.4	
	30-36	5.20	35.4	
	36-42	5.20	42.4	
	42-48	3.80	32.8	
	48-54	3.24	26.6	
	54-60	1.25	7.0	
		EC_{sw}		
6/25/74	12	9.60	64.8	32.0"
	24	7.80	53.0	
	36	1.95	14.6	
	42	1.38	12.0	
	48	1.35	10.6	
	6 ft	1.30	8.6	
7/9/74	12	9.00	65.8	39.0"
	24	6.60	42.4	
rain	36	2.05	15.0	
7/8 & 7/9/74	42	1.60	10.8	
	48	1.55	10.8	
	6 ft	1.30	8.6	
7/31/74	12	-	-	54.0"
	24	5.68	41.8	
Soil Water	36	1.90	13.8	
	42	1.55	10.2	
	48	1.30	9.6	
	6 ft	1.22	9.0	
8/14/74	12	-	-	65.0"
	24	-	-	
	36	1.82	13.0	
	42	1.50	10.4	
	48	1.52	10.0	
	6 ft	1.38	8.8	
		- End Season -		
		EC_e		
9/16/74	0-6	22.00	160.1	60.0"
	6-12	6.00	40.2	
Soil	12-18	2.60	17.6	
	18-24	2.20	17.2	
	24-30	-	-	
	30-36	2.20	16.8	
	36-42	3.25	25.4	
	42-48	8.40	54.6	
	48-54	6.90	41.0	
	54-60	9.20	75.2	

BACON ISLAND ASPARAGUS
- Spud Ditch -

Site 1

Date	Depth Inches	pH	EC_e	Ca^{++} Mg^{++}	HCO_3^-	Cl^-	Water Table	EC_w
				ME/L				
				- Mid Winter -				
3/13/74	0-6	6.5	0.50	2.8		0.1		
	6-12	6.8	1.20	9.2		0.2		
Soil	12-18	6.8	1.42	9.6		4.2		
	18-24	6.4	1.15	8.2		2.0		
	24-30	4.5	4.90	50.0		7.0		
	30-36	4.5	4.00	43.8		6.6		
	36-42	4.5	1.50	14.2		3.6		
	42-48	4.5	1.45	10.8		3.6		
	48-54	4.4	1.80	14.8		4.0		
	54-60	4.3	2.19	21.0		3.2		
				- Beginning Season -				
6/5/74	0-6	5.8	1.20	12.2		5.0		
	6-12	5.7	1.48	13.4		2.4		
Soil	12-18	5.7	1.30	10.4		4.4		
	18-24	5.4	1.48	11.2		3.4		
	24-30	5.3	2.50	19.8		4.4		
	30-36	5.2	3.00	23.8		11.2		
	42-48	4.8	4.54	39.8		13.6		
	48-54	4.9	5.00	43.2		15.0		
			EC_{sw}					
6/26/74	24	8.4	2.68	25.6	1.0	8.2	60.0"	
	36	8.3	4.80	34.6	1.0	10.0		
	48	8.1	3.40	26.6	1.0	8.4		
	60	8.1	3.60	28.6	0.6	11.6		
7/10/74	24	8.1	3.10	27.4	0.6	10.0	65.0"	
	36	8.0	4.00	37.8	1.2	11.0		
Soil Water	48	8.1	3.28	26.0	0.6	8.2		
	60	7.5	3.25	28.4	0.4	11.0		
7/31/74	24	-	-	-	-	-		
	36	7.8	3.38	29.4	0.4	8.4	63.0"	
	48	7.7	4.30	37.4	1.2	10.8		
	60	7.2	3.80	30.0	0.4	11.4		
8/14/74	24	8.4	2.08	25.6	1.0	8.2	69.0"	
	36	8.0	4.05	29.6	0.8	9.0		
	48	8.3	4.95	36.8	1.0	10.2		
	60	-	-	-	-	-		
				- End Season -				
			EC_e					
8/19/74	0-6	6.7	1.80	16.2		16.0		
	6-12	6.4	1.62	14.0		4.8		
Soil	12-18	6.2	1.10	8.2		3.4		
	18-24	6.5	1.03	6.6		3.8		
	24-30	5.9	3.20	18.6		6.4		
	30-36	5.3	3.20	22.8		8.0		
	36-42	5.0	3.30	26.2		9.0		
	42-48	5.2	3.60	29.6		10.2		
	48-54	4.8	4.00	34.8		11.0		
	54-60	4.9	5.00	43.6		14.2		

TERMINOUS ASPARAGUS
- No Irrigation -

Site 2

Date	Depth Inches	pH	EC_e	Ca^{++} Mg^{++}	HCO_3^-	Cl^-	Water Table	EC_w
				ME/L				
				- Early Winter -				
11/28/73	0-6	6.3	0.70	8.4		1.6		
	6-12	6.5	0.68	7.8		2.6		
Soil	12-18	6.0	1.12	12.4		1.8		
	18-24	6.3	0.38	2.6		1.0		
	24-30	6.1	0.80	7.2		2.0		
	30-36	6.2	0.70	5.8		1.6		
	36-42	6.2	0.65	5.8		1.2		
	42-48	6.4	0.48	3.8		ns		
	48-54	6.8	0.50	4.0		ns		
	54-60	6.8	0.58	4.6		1.4		
				- Mid Winter -				
1/25/74	0-6	6.6	0.41	5.0		1.0		
	6-12	6.4	0.46	5.0		1.6		
Soil	12-18	6.1	2.00	19.2		3.0		
	18-24	5.6	4.00	45.2		3.2		
	24-30	5.8	2.40	25.6		3.2		
	30-36	6.1	0.96	9.6		1.0		
	36-42	6.3	0.69	5.8		1.2		
	42-48	6.7	0.50	3.8		1.0		
	58-54	7.0	0.48	3.8		1.0		
			EC_{sw}					
6/27/74	27	8.3	1.80	16.8	1.0	2.8	38.0"	
	33	7.7	1.56	10.0	0.8	2.0		
	39	-	-	-	-	-		
	45	-	-	-	-	-		
	51	-	-	-	-	-		
7/11/74	27	8.1	1.80	17.2	1.0	2.2	54.0"	(mud)
	33	8.2	1.30	11.8	0.8	1.8		
	39	8.3	1.05	10.4	0.8	2.0		
Soil Water	45	8.3	1.00	9.0	1.0	1.4		
	51	8.3	0.99	9.4	1.0	1.6		
8/1/74	27	8.0	1.95	18.4	0.6	3.0	54.0"	(mud)
	33	7.5	1.35	12.6	0.6	2.2		
	39	7.9	1.10	10.0	0.6	2.2		
	45	8.4	0.70	7.0	1.2	1.2		
	51	8.4	0.52	5.6	1.0	1.4		
8/16/74	27	8.2	1.91	19.8	0.4	1.2	54.0"	(mud)
	33	8.1	1.40	14.8	0.6	1.8		
	39	8.1	1.10	10.0	0.6	1.6		
	45	7.9	0.68	9.8	-	-		
	51	7.9	0.60	5.2	1.0	1.4		
				- End Season -				
			EC_e					
9/16/74	0-6	6.2	1.54	12.6		1.6		
	6-12	6.3	1.25	11.4		1.4		
Soil	12-18	6.3	2.20	18.8		3.0		
	18-24	5.8	4.80	44.0		5.2		
	24-30	5.4	1.30	10.8		2.2		
	30-36	5.9	0.59	5.0		1.8		
	36-42	6.7	0.40	2.8		0.8		
	42-48	6.9	0.40	3.6		0.8		
	48-54	7.3	0.88	7.0		1.0		
	54-60	7.3	0.88	7.0		1.0		

TERMINOUS "Y" VIRGIN PEAT SOIL
- No Irrigation -

Site 4

Date	Depth Inches	pH	EC_e	Ca^{++} Mg^{++}	HCO_3^-	Cl^-	Water Table	EC_w
				ME/L				
				- Mid Winter -				
1/25/74	0-6	6.8	0.40	3.6		1.2		
	6-12	6.0	0.38	4.0		2.0		
Soil	12-18	6.1	0.60	4.8		1.8		
	18-24	5.8	1.28	9.4		4.2		
	24-30	6.0	1.00	7.0		2.6		
	30-36	5.6	2.20	16.4		7.4		
	36-42	5.5	3.20	22.4		11.0		
	42-48	5.5	4.00	27.6		16.2		
	48-54	5.7	3.70	21.0		15.6		
				- Beginning Season -				
				- not taken -				
			EC_{sw}					
7/11/74	42	7.7	2.90	10.0	0.8	7.2	56.0"	
	48	8.0	1.85	10.0	0.8	8.0		
Soil	54	7.7	1.97	10.2	1.4	6.6		
Water	60	7.5	1.90	8.4	1.6	8.2		
8/1/74	42	8.0	1.40	8.4	0.6	8.2	57.0"	
	48	8.1	2.05	12.6	1.2	8.6		
	54	8.4	1.90	11.6	1.8	8.2		
	60	8.6	1.73	9.6	1.8	8.2		
8/16/74	42	7.6	1.90	11.0	0.4	7.6	59.0"	
	48	-	-	-	-	-		
	54	8.2	1.90	10.6	1.8	8.2		
	60	8.2	1.80	10.9	1.2	8.2		
				- End Season -				
			EC_e					
9/18/74	0-6	6.2	1.50	8.0		6.8		
	6-12	6.2	0.70	5.2		3.4		
Soil	12-18	5.9	0.78	5.4		3.4		
	18-24	6.2	0.40	6.0		3.6		
	24-30	5.7	1.80	12.0		7.6		
	30-36	5.5	2.50	18.4		7.5		
	36-42	5.6	5.00	36.4		14.4		
	42-48	5.6	5.80	44.0		16.8		
	48-54	5.4	6.80	44.4		24.4		
	54-60	5.6	7.00	34.6		27.0		

BACON ISLAND POTATOES
- Spud Ditch Every 12 Rows -

Site 6

Date	Depth Inches	pH	EC_e	Ca^{++} Mg^{++} ME/L	HCO_3^- ME/L	Cl^- ME/L	Water Table	EC_w
			- Mid Winter -					
2/5/74	0-6	6.6	0.25	2.6		2.4		
	6-12	6.7	0.45	3.0		1.4		
Soil	12-18	5.9	0.90	6.2		3.8		
	18-24	6.3	0.70	4.6		2.8		
	24-30	5.4	1.26	9.6		6.8		
Planted	30-36	5.5	1.75	12.4		6.2		
4/15/74	36-42	5.5	1.68	12.2		7.2		
			- Beginning Season -					
5/16/74	0-6	5.7	3.90	48.2		7.2	14.0"	
	6-12	6.1	1.52	15.2		5.8		
Soil	12-18	6.1	0.75	7.2		2.2		
	18-24	5.9	0.53	4.4		2.4		
	24-30	5.1	1.20	11.0		5.4		
	30-36	5.7	2.20	16.2		~~21.6~~ 10.8		
			EC_{sw}					
5/16/74							14.0"	0.15 (River)
								0.20 (Drain Pump)
								0.14 (Intake Syphon)
5/23/74								0.11 (River)
Soil Water								0.15 (Drain Pump)
								0.12 (4' Drain just below plot)
5/27/74	18	8.5	1.65	15.8	1.4	3.8	12.0"	
	6	8.5	1.30	10.6	1.2	5.0		
6/5/74								0.10 (River)
6/26/74	6	8.2	0.71	6.0	0.8	2.4	38.0"	0.13 (River)
	12	8.5	0.92	8.2	1.4	2.0		0.60 (Drain Pump)
	18	8.4	0.68	5.6	1.0	2.2		0.60 (4' Drain)
	24	8.4	0.61	5.4	1.0	1.4		
	30	8.0	0.60	5.4	1.2	1.2		
	6 ft	-	-	-	-	-		
7/10/74	6	-	-	-	-	-	39.0	0.20 (River)
	12	-	-	-	-	-		0.50 (Drain Pump)
	18	-	-	-	-	-		
	24	8.4	0.60	5.0	1.0	1.4		
	30	-	-	-	-	-		
	6 ft	7.9	0.90	7.6	1.0	3.0		
7/31/74								0.26 (Drain Pump)
8/14/74								0.36 (River)
								0.35 (Drain Pump)
			- End Season -					
			EC_e					
9/18/74	0-6	6.0	4.36	29.2		16.4		
	6-12	6.2	2.79	22.8		9.0		
Soil	12-18	6.2	1.50	9.8		5.0		
	18-24	5.1	1.90	14.2		5.6		
	24-30	5.5	1.80	29.4		5.8		
	30-36	5.3	3.00	32.2		7.8		
	36-42	5.5	4.00	36.2		9.0		
	42-48	5.6	4.40	37.8		9.8		
	48-54	5.3	4.80	44.8		10.6		
	54-60	5.4	4.60	40.8		10.8		

TERMINOUS CORN
- Spud Ditch -

Site 8-9

Date	Depth Inches	pH	EC_e	Ca^{++} Mg^{++} ME/L	HCO_3^- ME/L	Cl^- ME/L	Water Table	EC_w
				- Mid Winter -				
1/25/74	0-6	6.5	0.51	3.1		1.0		
	6-12	6.4	0.60	3.6		1.8		
½ distance	12-18	6.2	0.90	3.5		1.0		
from Spud	18-24	5.9	0.72	4.5		2.2		
Ditch	24-30	5.8	0.91	10.7		7.4		
Soil	30-36	5.8	1.00	3.9		2.0		
	36-42	6.2	1.00	3.3		2.8		
	42-48	6.2	0.95	3.7		3.2		
	48-54	6.5	0.75	2.8		2.4		
	54-60	6.7	0.70	2.6		2.6		
1/25/74	0-6	6.3	1.38	5.6		3.4		
	6-12	6.5	0.77	3.1		1.6		
½ distance	12-18	6.2	0.82	3.5		1.0		
between	18-24	6.2	0.92	3.9		1.2		
Spud Ditches	24-30	6.2	0.85	4.0		1.0		
Soil	30-36	6.1	1.10	4.4		2.4		
	36-42	6.3	1.33	5.3		4.4		
	42-48	6.4	1.00	3.6		3.0		
	48-54	6.6	0.90	3.6		2.6		
	54-60	6.8	0.92	3.5		3.0		
				- Beginning Season -				
5/16/74	0-6	6.4	1.30			7.4		
	6-12	6.3	1.75	16.2		8.4		
Soil	12-18	6.3	0.90	9.6		3.8		
	18-24	6.0	0.62	8.4		2.2		
	24-30	1.0	0.75	8.2		2.6		
	30-36	6.0	1.10	11.8		4.2		
	36-42	6.8	1.10	12.0		3.2		
	42-48	7.3	1.20	10.4		3.8		
			EC_{sw}					
6/27/74	30						52.0"	0.66 (Main Drain)
	36	8.7	1.60	8.5	0.8	2.2		0.12 (River)
	6 ft	8.3	1.60	20.0	0.8	2.2		
7/11/74	30	7.8	3.65	21.6	-	-	24.0"	0.50 (Spud Ditch)
Soil	36	8.3	2.20	12.9	-	-	water in	0.45 (Main Drain)
Water	6 ft	8.5	1.45	10.4	1.4	3.6	Spud Ditch	0.14 (River)
8/1/74	12	7.8	3.40	19.2	0.4	4.8		0.27 (Spud Ditch)
	18	8.2	1.60	7.2	1.8	6.2		0.47 (Main Drain)
	24	8.6	1.70	11.4	-	-	Supply to Spud Ditch →	0.20 (4' Ditch)
	36	8.6	2.38	25.4	-	-		0.14 (River)
	6 ft	8.3	2.10	19.0	1.6	6.6		
8/16/74								0.15 (River)
				- End Season -				
			EC_e					
9/16/74	0-6	6.5	2.15	18.6		5.2		
	6-12	6.5	0.50	4.4		1.2		
Soil	12-18	6.3	0.60	6.6		1.8		
	18-24	5.9	1.10	10.4		1.8		
	24-30	5.8	1.18	10.6		0.2		
	30-36	6.2	1.38	11.2		2.6		
	36-42	6.8	1.95	16.8		5.4		
	42-48	7.1	1.40	12.4		3.2		
	48-54	7.8	1.00	8.0		2.8		

STATEN ISLAND ALFALFA
- Sprinkler Irrigated -

Site 12

Date	Depth Inches	pH	EC_e	Ca^{++} Mg^{++}	HCO_3^-	Cl^-	Water Table	EC_w
				ME/L				
			- Mid Winter -					
2/1/74	0-6	5.8	0.36	3.0		3.2		
	6-12	5.6	0.50	3.8		4.0		
Soil	12-18	5.7	0.69	3.8		4.8		
	18-24	5.8	0.55	3.6		3.4		
	24-30	5.9	0.50	4.4		2.6		
	30-36	6.6	0.30	2.8		1.8		
	36-42	6.6	0.28	2.4		1.6		
	42-48	6.7	0.33	3.6		1.6		
	48-54	6.8	0.32	4.0		1.0		
	54-60	6.8	0.27	3.5		2.0		
			- Beginning Season -					
5/29/74	0-6	6.4	0.35	2.8		2.0		
	6-12	6.6	0.40	3.0		4.0		
Soil	12-18	5.6	0.60	4.6		3.4		
	18-24	5.8	0.51	4.2		4.4		
	24-30	6.0	0.48	4.0		3.0		
	30-36	5.7	0.45	3.4		3.4		
	36-42	6.4	0.35	2.0		1.2		
	42-48	6.1	0.40	2.6		1.6		
			EC_{sw}					
6/25/74	6	-	-	-	-	-	25.0"	0.14 (4' Ditch)
	12	8.6	0.56	5.0	1.4	1.4		Irrigation from
	18	8.5	0.61	7.6	1.0	2.6		this ditch.
	24	8.5	0.45	4.0	1.2	1.2		
	30	8.5	0.48	4.6	0.8	1.2		
	36	8.5	0.61	4.6	1.2	1.6		
7/9/74	6	-	-	-	-	-	29.0"	0.50 (4' Ditch)
	12	8.5	0.68	6.4	3.8	1.6		
Soil Water	18	8.5	0.61	5.4	0.6	1.0		
	24	8.4	0.47	4.4	1.0	1.0		
	30	8.2	0.50	5.4	1.2	1.2		
	36	8.3	0.60	5.6	1.2	1.4		
7/31/74	6	-	-	-	-	-	23.0"	0.12 (4' Ditch)
	12	8.2	0.50	5.0	1.4	1.4		
	18	7.9	0.40	3.8	0.8	1.0		
	24	7.4	0.55	4.6	1.2	1.4		
	30	8.2	0.68	5.8	1.2	1.6		
	36	8.0	0.58	5.4	1.4	1.4		
8/14/74	6	-	-	-	-	-	36.0"	0.20 (4' Ditch)
	12	8.5	0.61	6.0	1.6	0.2		
	18	-	-	-	-	-		
	24	8.3	0.42	4.0	1.0	1.4		
	30	8.1	0.50	4.4	1.2	1.0		
	36	8.0	0.56	5.6	1.6	1.4		
			- End Season -					
			EC_e					
9/18/74	0-6	5.6	0.45	4.0		2.6		
	6-12	5.7	0.50	3.2		3.0		
Soil	12-18	5.9	0.34	2.8		1.4		
	18-24	5.9	0.35	3.0		1.0		
	24-30	-	-	-		-		
	30-36	6.4	0.24	2.2		0.7		
	36-42	6.6	0.46	3.4		0.9		
	42-48	7.0	0.29	2.4		0.5		
	48-54	7.0	0.28	1.4		0.5		
	54-60	6.8	0.30	1.6		0.4		

RINDGE TRACT CORN
- Spud Ditch -

Site 13

Date	Depth Inches	pH	EC_e	Ca^{++} Mg^{++}	HCO_3^-	Cl^-	Water Table	EC_w
				ME/L				
				- Mid Winter -				
2/1/74	0-6	6.6	0.60	4.0		1.6	36.0"	
	6-12	6.3	0.46	3.2		1.6		
Soil	12-18	6.6	0.98	4.2		4.0		
	18-24	5.5	2.05	7.6		10.4		
	24-30	5.6	3.40	11.2		22.8		
	30-36	5.7	3.60	12.8		28.4		
	36-42	5.6	6.30	25.4		60.0		
	42-48	5.5	6.10	25.4		53.4		
	48-54	5.7	3.60	10.6		35.0		
				- Beginning Season -				
5/16/74	0-6	6.7	0.85	4.2		3.2	36.0"	
	6-12	6.4	0.95	4.8		3.6		
Soil	12-18	6.2	1.19	5.8		5.4		
	18-24	5.5	3.00	13.0		18.0		
	24-30	5.5	3.20	12.2		18.4		
	30-36	5.6	6.20	27.6		38.6		
	36-42	5.5	8.20	37.0		68.0		
	42-48	5.4	8.00	39.0		65.8		
			EC_{sw}					
6/27/74	6	-	-	-	-	-	52.0"	0.14 (River)
	12	-	-	-	-	-		0.47 (Drain Pump)
	18	-	-	-	-	-		0.30 (Ditch, drain next to field)
	24	8.2	3.94	18.4	1.2	26.2		
	6 ft	8.1	3.15	12.4	1.6	28.6		
7/11/74	6	7.9	4.35	23.0	-	-	42.0"	0.15 (River)
rain	12	7.9	2.97	17.8	0.6	21.8		0.35 (Drain Pump)
7/8 & 7/9/74	18	7.8	0.78	3.2	0.6	5.8		
	24	8.4	3.90	19.0	1.2	25.6		
	30	7.7	4.20	30.8	1.0	28.4		
	6 ft	8.0	3.05	12.4	1.6	28.2		
8/1/74	6	7.7	4.68	24.2	0.6	24.8	45.0"	0.15 (River)
	12	7.6	4.47	21.4	0.6	23.2		0.45 (Pump)
Soil Water	18	8.3	1.50	7.0	0.6	9.4		
	24	8.2	3.40	14.8	1.6	22.0		
	30	8.0	3.56	18.4	1.0	25.8		
	6 ft	7.8	2.80	10.0	1.0	27.6		
8/16/74	6	-	-	-	-	-	56.0"	0.16 (River)
	12	-	-	-	-	-		0.23 (Pump)
	18	7.5	1.45	6.2	0.8	9.4		
	24	8.3	3.20	18.0	1.6	23.4		
	30	8.2	3.20	14.6	0.8	26.2		
	6 ft	7.4	3.10	11.8	1.4	27.8		
				- End Season -				
			EC_e					
10/4/74	0-6	6.4	1.80	9.4		8.4	60.0"	
	6-12	6.2	1.75	7.4		8.2		
Soil	12-18	5.8	2.10	8.6		11.6		
	24-30	5.6	2.15	7.4		12.0		
	30-36	5.8	3.40	12.8		25.2		
	36-42	5.4	5.40	21.0		43.8		
	42-48	5.5	5.26	19.0		45.8		
	48-54	5.6	6.80	24.8		65.8		

STATEN ISLAND CORN
- Spud Ditch - Flooded Summer 1973 -

Site 20

Date	Depth Inches	pH	EC_e	Ca^{++} Mg^{++}	HCO_3^-	Cl^-	Water Table	EC_w
				ME/L				
			- Beginning Season -					
5/29/74	0-6	5.9	1.30	8.8		2.0		
	6-12	6.7	0.78	4.2		1.0		
Soil	12-18	6.6	0.70	5.2		1.0		
	18-24	6.7	0.58	5.4		1.0		
	24-30	6.5	0.70	4.8		1.4		
	30-36	6.4	0.60	5.6		2.0		
	36-42	6.3	0.69	4.4		1.7		
	42-48	-	-	-		-		
	48-54	6.0	1.00	4.0		4.2		
	54-60	6.0	1.30	5.6		5.4		
			EC_{sw}					
6/19/74	18	8.3	1.41	10.6	-	-	9.0"	0.11 (Spud)
rain	6 ft	8.7	1.51	7.8	2.8	4.8		0.12 (4' Ditch)
6/19/74								
6/25/74	18	-	-	-	-	-	32.5"	0.42 (4' Ditch)
	24	8.3	1.28	10.6	1.8	4.6		0.25 (Ditch)
	30	8.4	1.40	12.2	2.2	4.4		0.32 (Pump)
	36	8.6	1.33	11.2	2.2	4.2		0.14 (River)
	6 ft	8.8	1.47	6.4	2.6	4.8		
7/9/74	18	-	-	-	-	-	42.0"	0.19 (River)
rain	24	8.6	1.24	9.6	0.8	2.6		
7/8 & 7/9/74	30	8.6	1.25	9.8	2.0	4.2		
	36	8.7	1.30	10.0	1.0	2.2		
	6 ft	8.7	1.45	5.8	2.6	4.8		
7/31/74	18	-	-	-	-	-		1.20 (4' Ditch)
Soil	24	-	-	-	-	-		1.35 (Ditch)
Water	30	-	-	-	-	-		0.20 (Pump)
	36	-	-	-	-	-		0.14 (River)
	6 ft	8.2	1.35	6.4	2.2	4.2		
8/14/74	18	-	-	-	-	-		0.33 (Ditch)
	24	8.7	1.20	8.4	2.0	3.0		0.20 (Pump)
	30	8.7	1.30	11.6	2.4	4.0		0.13 (River)
	36	8.7	1.22	10.0	4.2	3.4		
	6 ft	8.5	1.40	6.0	2.2	4.2		
9/10/74								1.25 (Ditch)
								0.89 (Pump)
								0.30 (River)
			- End Season -					
			EC_e					
9/16/74	0-6	6.1	2.55	14.8		6.2		
	6-12	7.3	1.20	6.4		9.2		
Soil	12-18	6.8	0.80	5.0		2.0		
	18-24	6.3	0.82	7.4		2.0		
	24-30	6.0	0.60	4.0		2.4		
	30-36	6.0	0.80	9.4		3.0		
	36-42	5.8	1.50	4.2		4.8		
	42-48	5.6	2.00	14.6		4.8		
	48-54	5.5	3.23	29.6		6.4		
	54-60	5.4	4.46	34.0		7.8		

SHERMAN ISLAND CORN
- Furrow -

Site 23

Date	Depth Inches	pH	EC_e	Ca^{++} Mg^{++}	HCO_3^-	Cl^-	Water Table	EC_w
				ME/L				
			- Beginning Season -					
5/29/74	0-6	6.4	9.00	50.6		67.0		
	6-12	6.6	5.80	35.6		44.2		
Soil	12-18	5.9	4.10	25.6		33.0		
	18-24	5.8	4.20	22.2		38.8		
	24-30	5.6	4.00	21.6		45.4		
	30-36	5.7	5.20	31.0		35.4		
	36-42	5.9	5.20	30.8		42.4		
	42-48	5.8	3.80	22.0		32.8		
	48-54	5.8	3.24	21.4		26.6		
	54-60	5.7	1.25	9.8		7.0		
			EC_{sw}					
6/25/74	12	7.8	9.60	49.8	1.4	64.8	32.0"	0.14 (Irr.Ditch)
	24	8.3	7.80	42.6	1.4	53.0		0.50 (4' Ditch)
	36	8.3	1.95	11.4	1.4	14.6		drain by field
	42	8.2	1.38	9.0	1.2	12.0		
	48	8.4	1.35	8.4	1.2	10.6		
	6 ft	8.5	1.30	8.8	1.8	8.6		
7/9/74	12	7.8	9.00	52.0	2.4	65.8	39.0"	0.32 (Irr.Ditch)
	24	8.0	6.60	37.0	1.2	47.4		1.75 (4' Ditch)
Soil Water	36	7.7	2.05	13.8	2.0	15.0		
	42	7.8	1.60	10.0	1.6	10.8		
	48	7.8	1.55	10.2	1.6	10.8		
	6 ft	8.5	1.30	8.8	1.8	8.6		
7/31/74	12	-	-	-	-	-	54.0"	0.16 (Irr.Ditch)
	24	8.2	5.68	34.4	0.6	41.8		0.32 (4' Ditch)
	36	7.9	1.90	13.2	1.0	13.8		
	42	7.6	1.55	10.0	1.6	10.2		
	48	8.0	1.30	9.8	1.4	9.6		
	6 ft	7.8	1.22	9.6	1.6	9.0		
8/14/74	12	-	-	-	-	-	65.0"	0.15 (Irr.Ditch)
	24	-	-	-	-	-		
	36	8.5	1.82	11.6	1.8	13.0		
	42	8.2	1.50	9.8	1.4	10.4		
	48	8.5	1.52	11.2	2.0	10.0		
	6 ft	8.3	1.38	9.4	1.4	8.8		
			- End Season -					
			EC_e					
9/16/74	0-6	6.5	22.00	134.6		160.1	60.0"	
	6-12	6.9	6.00	28.8		40.2		
Soil	12-18	7.1	2.60	11.6		17.6		
	18-24	6.8	2.20	8.4		17.2		
	24-30	6.9	-	4.6		-		
	30-36	6.5	2.20	11.2		16.8		
	36-42	6.0	3.25	21.2		25.4		
	42-48	5.5	8.40	59.4		54.6		
	48-54	5.9	6.90	52.4		41.0		
	54-60	5.7	9.20	62.6		75.2		

TERMINOUS ASPARAGUS
- No Irrigation -

Site 2

Date	Depth Inches	Water Table	NO_3-N	PO_4-P	SO_4-S	K	
			PPM				
6/27/74	33	38.0"	8.2	<0.1	145.0	4.3	suction probe
7/11/74	39	54.0"	6.8	<0.1	156.0	4.3	"
7/31/74	60		1.0	<0.1	104.0	7.6	"
8/1/74	33	54.0"	48.0	<0.1	154.0	4.0	"
	39		5.4	<0.1	166.0	4.3	"

TERMINOUS "Y" VIRGIN PEAT SOIL
- No Irrigation -

Site 4

Date	Depth Inches	Water Table	NO_3-N	PO_4-P	SO_4-S	K	
			PPM				
7/11/74	54	56.0"	2.0	<0.1	209.0	3.4	suction probe

BACON ISLAND POTATOES
- Spud Ditch Every 12 Rows -

Site 6

Date	Depth Inches	Water Table	NO_3-N	PO_4-P	SO_4-S	K	
			PPM				
6/26/74	30	38.0"	1.0	0.1	53.0	4.6	suction probe
7/10/74	6 ft	39.0"	<1.0	0.1	88.0	2.9	"
	River		<1.0	<0.1	4.7	2.0	
	Drain Pump		1.0	<0.1	8.6	2.3	
7/31/74	Drain Pump		2.0	<0.1	12.8	3.2	
8/14/74	River		2.0	<0.1	6.2	3.6	
	Drain Pump		1.0	<0.1	16.0	3.4	
9/10/74	River		<1.0	<0.1	3.2	1.8	
	Drain Pump		<1.0	<0.1	7.4	2.3	

TERMINOUS CORN
- Spud Ditch -

Site 8-9

Date	Depth Inches	Water Table	NO_3-N	PO_4-P	SO_4-S	K
			PPM			
6/27/74	River	52.0"	<0.1	<0.1	5.2	1.8
	Drain		2.0	<0.1	5.9	3.8
7/11/74	Spud Ditch	24.0"	4.2	<0.1	34.0	5.0
	River		<0.1	<0.1	3.4	2.3
	Drain		1.0	<0.1	4.7	5.4
8/1/74	River		<1.0	<0.1	2.8	2.3
	Drain		2.4	0.1	6.4	3.8
	4 ft Ditch		1.0	<0.1	4.2	3.8
	Spud Ditch		1.0	<0.1	6.8	4.3
9/10/74	River		4.0	<0.1	4.0	3.6
	Drain		2.8	<0.1	6.2	3.4

STATEN ISLAND ALFALFA
- Sprinkler Irrigated -

Site 12

Date	Depth Inches	Water Table	NO_3-N	PO_4-P	SO_4-S	K	
			PPM				
6/25/74	12	25.0"	<1.0	<0.1	7.9	1.0	suction probe
	36		<1.0	<0.1	13.0	1.0	"
	4 ft Ditch		<1.0	<0.1	3.2	1.0	
7/9/74	30	29.0"	<1.0	<0.1	9.7	1.0	suction probe
	36		1.0	<0.1	12.0	1.0	"
	4 ft Ditch		<1.0	<0.1	2.8	3.4	
7/31/74	12	23.0"	<1.0	<0.1	6.7	1.8	suction probe
	18		2.4	<0.1	10.0	1.0	"
	24		<1.0	<0.1	5.0	1.0	"
	30		<1.0	<0.1	6.1	1.0	"
	36		<1.0	<0.1	11.2	1.0	"
	4 ft Ditch		<1.0	<0.1	3.2	2.7	
8/1/74	River		<0.1	<0.1	2.7	1.8	
	Drain		2.0	<0.1	6.2	2.0	
	18		2.4	<0.1	114.0	2.3	suction probe
	36		2.0	<0.1	42.0	5.0	"
	60		3.0	<0.1	4.1	6.3	"
8/16/74	Drain Pump		<1.0	<0.1	7.6	2.3	
9/10/74	River		<1.0	<0.1	3.4	1.8	
	Drain Pump		<1.0	<0.1	15.4	3.4	

STATEN ISLAND CORN
- Spud Ditch - Flooded Summer 1973 -

Site 20

Date	Depth Inches	Water Table	NO_3-N	PO_4-P	SO_4-S	K
			PPM			
6/25/74	River	32.5	<1.0	<0.1	2.0	1.5
	4 ft Ditch		<1.0	<0.1	19.0	2.9
	Drain Pump		2.5	<0.1	16.0	2.9
7/9/74	Drain	42.0	<1.0	<1.0	3.4	1.8
7/31/74	Drain		<0.1	<0.1	3.1	1.8
	Drain Pump		<1.0	<0.1	4.2	1.8
	4 ft Ditch		<1.0	0.14	5.0	5.0
8/14/74	River		<1.0	<0.1	2.2	2.3
	Drain Pump		2.0	<0.1	8.0	2.9
9/10/74	River		<1.0	<0.1	1.7	1.8
	Drain Pump		1.0	<0.1	2.2	4.3
	Drain		1.0	<0.1	6.4	2.3

SHERMAN ISLAND CORN
- Furrow -

Site 23

Date	Depth Inches	Water Table	NO_3-N	PO_4-P	SO_4-S	K	
			PPM				
6/25/74	12	32.0	2.7	<0.1	96.0	20.0	suction probe
	36		1.0	<0.1	45.0	7.8	"
	48		<1.0	<0.1	4.6	5.8	"
	4 ft Ditch		1.0	<0.1	14.6	4.8	
	Irri. Ditch		<1.0	<0.1	3.4	2.3	
7/31/74	36	54.0	2.0	<0.1	22.0	7.9	suction probe
	42		<1.0	0.1	3.2	6.8	"
	48		<1.0	<0.1	1.4	6.5	"
	60		<1.0	<0.1	5.0	6.1	"
	4 ft Ditch		<1.0	0.14	7.7	3.8	
	Irri. Ditch		<1.0	<0.1	4.4	2.0	
8/14/74	Irri. Ditch	65.0	<1.0	<0.1	3.4	2.7	

DEEP SOIL SUCTION & WATER TABLE

Date	Depth Inches	EC_{sw}	Cl^-	Water Table
		Site 2 - Terminous Asparagus		
12/5/74	27	2.33	4.0	
	33	1.55	4.0	
	39	0.91	1.4	
	45	0.40	1.0	
	51	0.60	2.5	
	72	0.68	3.2	
	82	0.68	6.2	
	Water Table	0.78	1.4	34.0"
		Site 4 - Terminous "Y" Virgin Peat Soil		
12/5/74	42	2.10	9.5	
	48	2.40	9.5	
	54	2.00	10.0	
	60	2.10	9.5	
	72	2.40	23.0	
	96	4.30	47.2	
	Water Table	1.71	8.8	39.0"
		Site 12 - Staten Island Alfalfa		
12/5/74	6	-	-	
	12	-	-	
	18	-	-	
	24	-	-	
	30	-	-	
	36	-	-	
	60	-	-	
	84	-	-	
	96	6.00	68.8	no water table

VARIABILITY OF SOIL SAMPLES EC_e TWO FEET APART

Date	Depth Inches	EC_e	EC_e	EC_e	Mean EC_e
		Site 2 - Terminous Asparagus			
9/16/74	0-6	1.54	1.05	0.89	1.16
	6-12	1.25	0.76	0.85	0.95
	12-18	2.20	2.05	1.20	1.82
	18-24	4.80	4.14	2.60	3.85
	24-30	1.30	2.30	1.41	1.67
	30-36	0.59	0.65	0.89	0.71
	36-42	0.40	0.45	0.65	0.50
	42-48	0.40	0.39	0.58	0.46
	48-54	0.88	0.68	0.80	0.79
		Site 23 - Sherman Island Corn			
9/16/74	0-6	22.00	20.50	24.50	22.33
	6-12	6.00	4.00	9.50	6.50
	12-18	2.60	7.80	6.60	5.67
	18-24	2.20	3.20	8.00	4.47
	24-30	0.82	3.10	4.00	2.64
	30-36	2.20	3.40	6.00	3.87
	36-42	3.25	4.60	5.28	4.38
	42-48	8.40	6.00	7.00	7.13
	48-54	6.90	3.40	4.25	4.85
	54-60	9.20	8.20	3.80	7.07

CLIMATOLOGICAL DATA
Monthly Precipatation

	Lodi			Stockton Waste Disposal		
	1972	1973	1974	1972	1973	1974
Jan.	0.64	6.10	2.42	0.69	6.39	1.73
Feb.	0.92	3.86	0.72	0.70	4.19	0.74
Mar.	0.40	3.18	3.86	0.70	3.18	2.59
April	1.39	0.09	2.45	0.57	0.23	2.79
May	0.14	0.02	0.00	0.11	0.04	0.00
June	0.22	0.00	0.41	0.15	0.00	0.34
July	0.00	0.00	0.88	0.00	0.00	0.61
Aug.	0.00	0.00	0.00	0.00	0.00	0.00
Sept.	0.82	0.28		0.66	0.08	
Oct.	1.15	2.08		0.74	2.08	
Nov.	5.10	4.41		0.22	3.66	
Dec.	2.20	3.96		0.38	3.87	
TOTAL	12.98	23.97		12.29	23.64	

	Rio Vista		
	1972	1973	1974
Jan.	0.77	7.68	2.10
Feb.	1.11	4.81	0.60
Mar.	0.00	2.48	3.43
April	1.00	0.09	2.12
May	0.04	0.10	0.00
June	0.28	0.00	0.52
July	0.00	0.00	0.55
Aug.	0.00	0.00	0.00
Sept.	0.49	0.08	
Oct.	3.46	1.84	
Nov.	4.86	5.17	
Dec.	1.88	3.08	
TOTAL	13.89	25.33	

from: NOAA, "Climatological Data"
11/20/74

SHERMAN ISLAND CORN

Site 23

	Date	Depth Inches	SP
	5/16/74	0-6	107
In		6-12	124
Soil		12-18	178
Samples		18-24	168
		24-30	146
		30-36	167
		36-42	154
		42-48	161
		48-54	141
		54-60	149
	9/16/74	0-6	104
Out		6-12	127
Soil		12-18	180
Samples		18-24	112
		24-30	128
		30-36	138
		36-42	151
		42-48	134
		48-54	113
		54-60	96

Figure 6
Site 9A

TERMINOUS CORN
After Irrigation Season

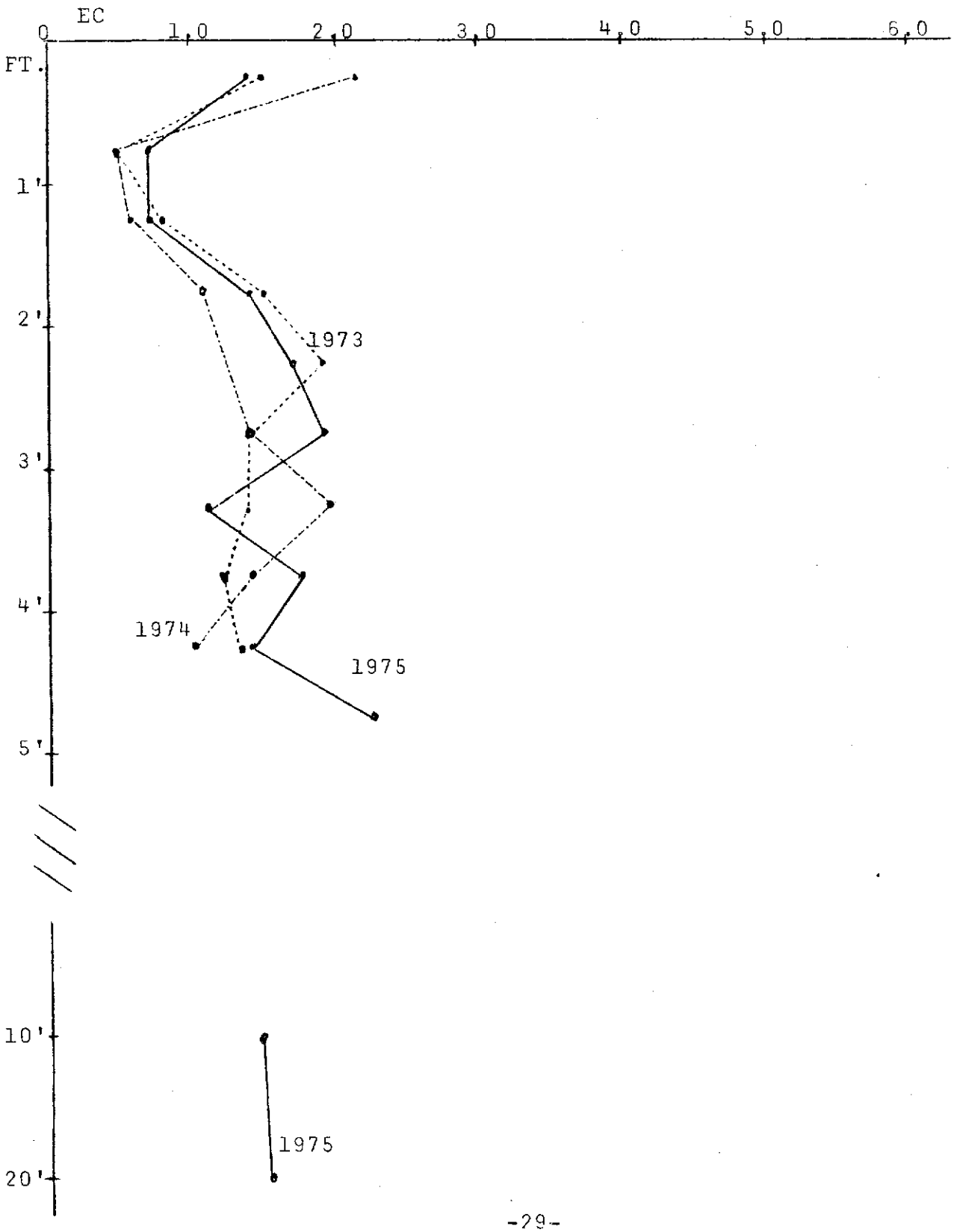
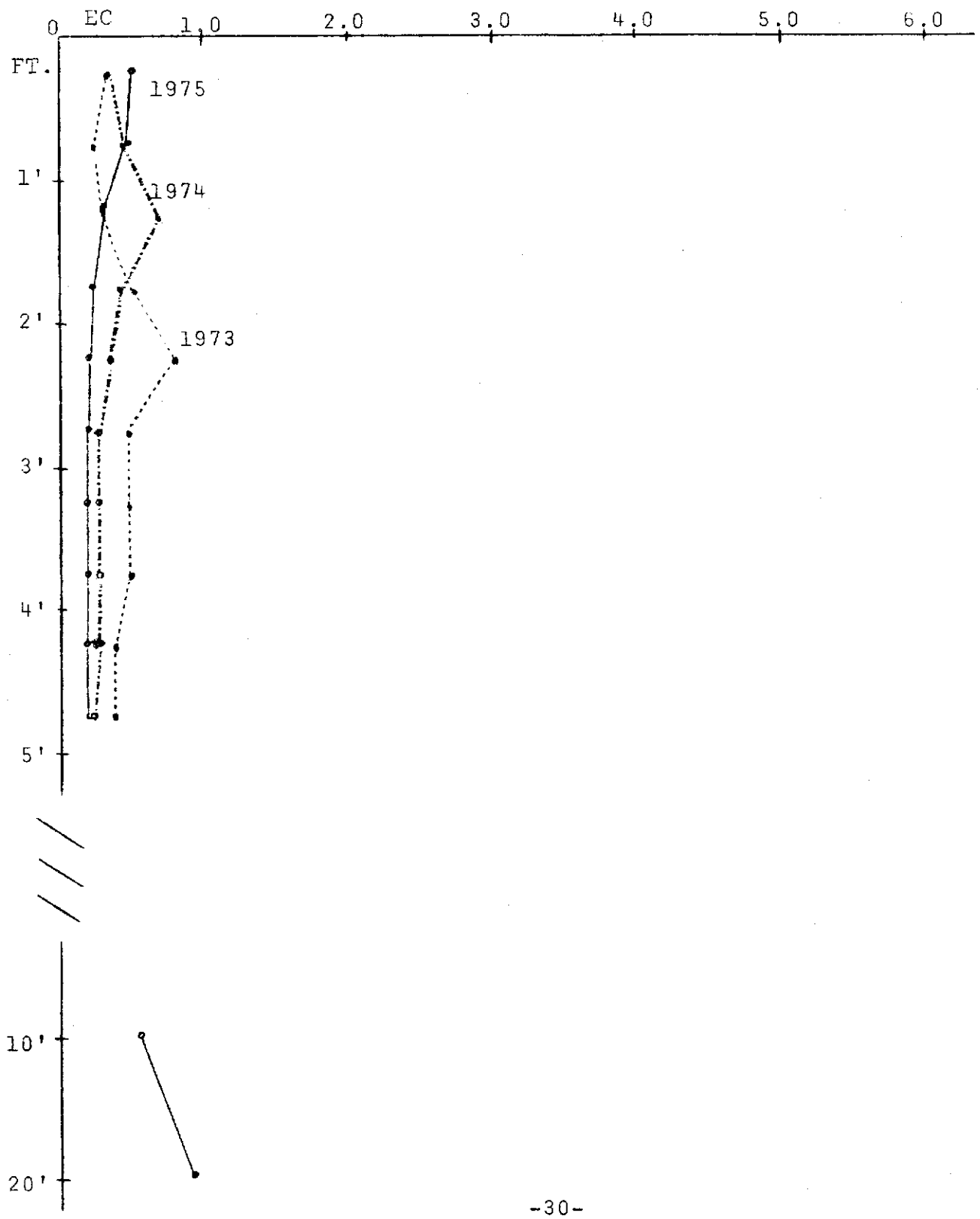


Figure 7
Site 12

STATEN ISLAND
Before Irrigation Season



1973 ·····
1974 -·-·-·-
1975 ——

Figure 8
Site 12

STATEN ISLAND
After Irrigation Season

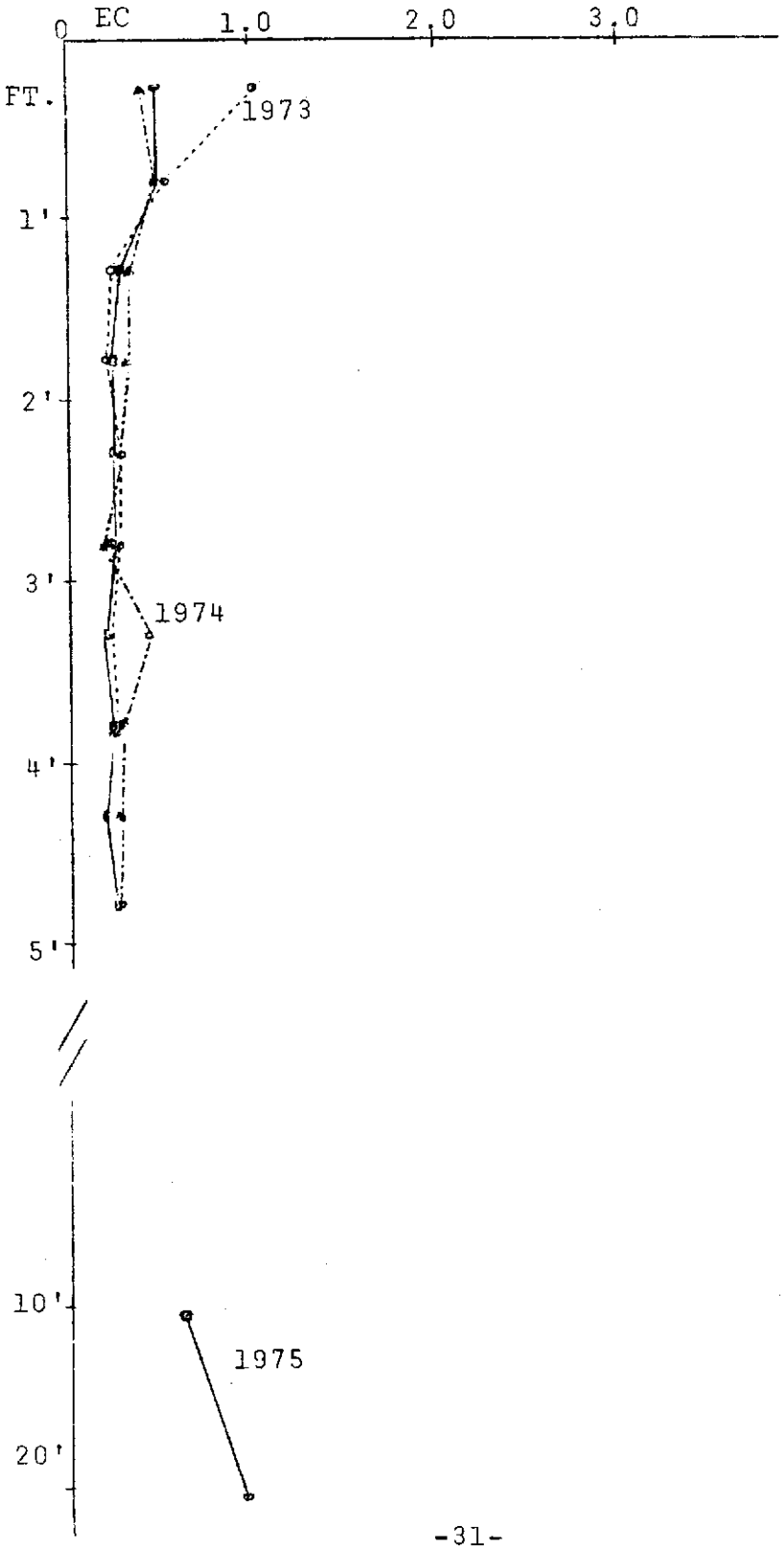
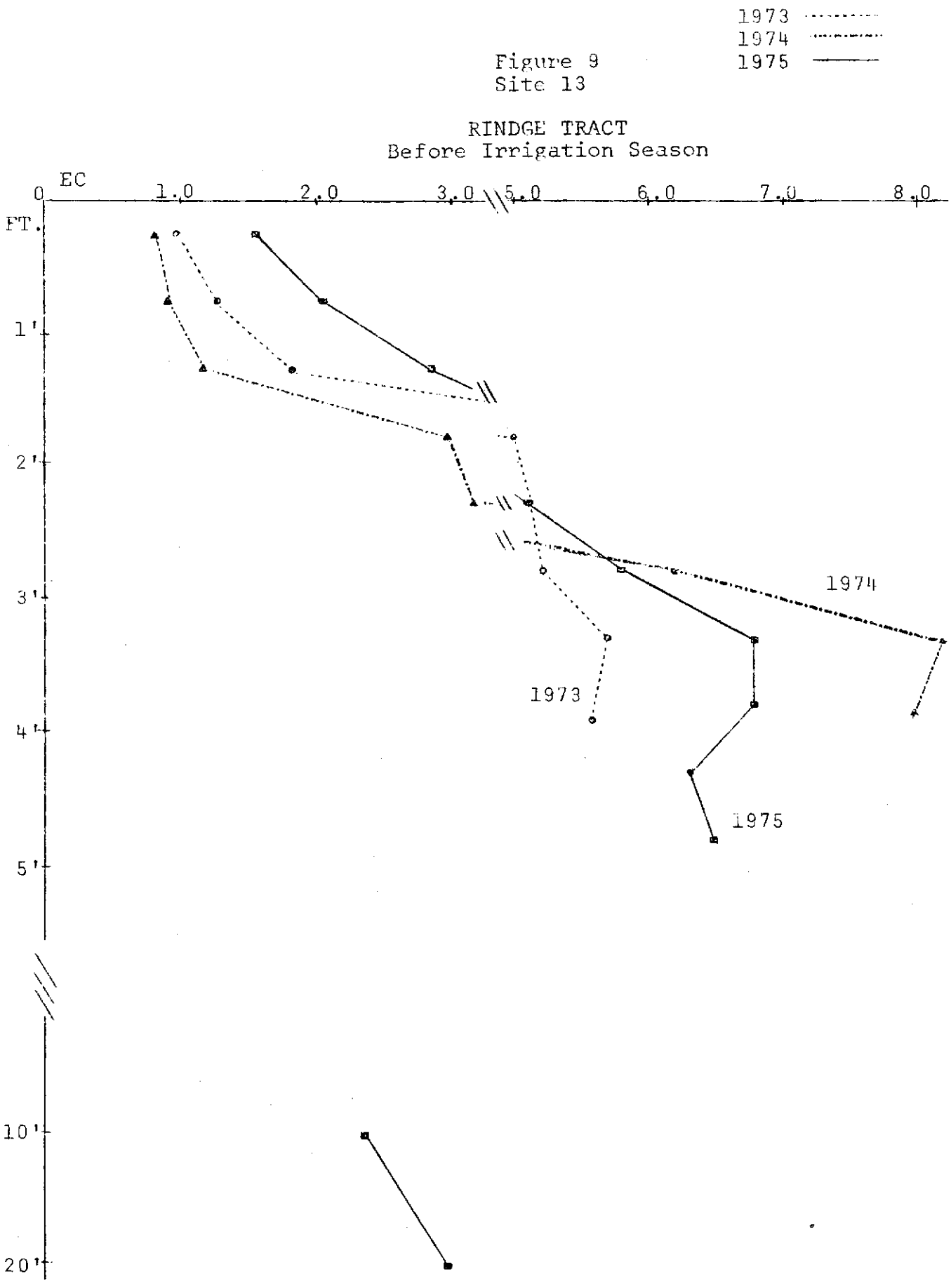


Figure 9
Site 13



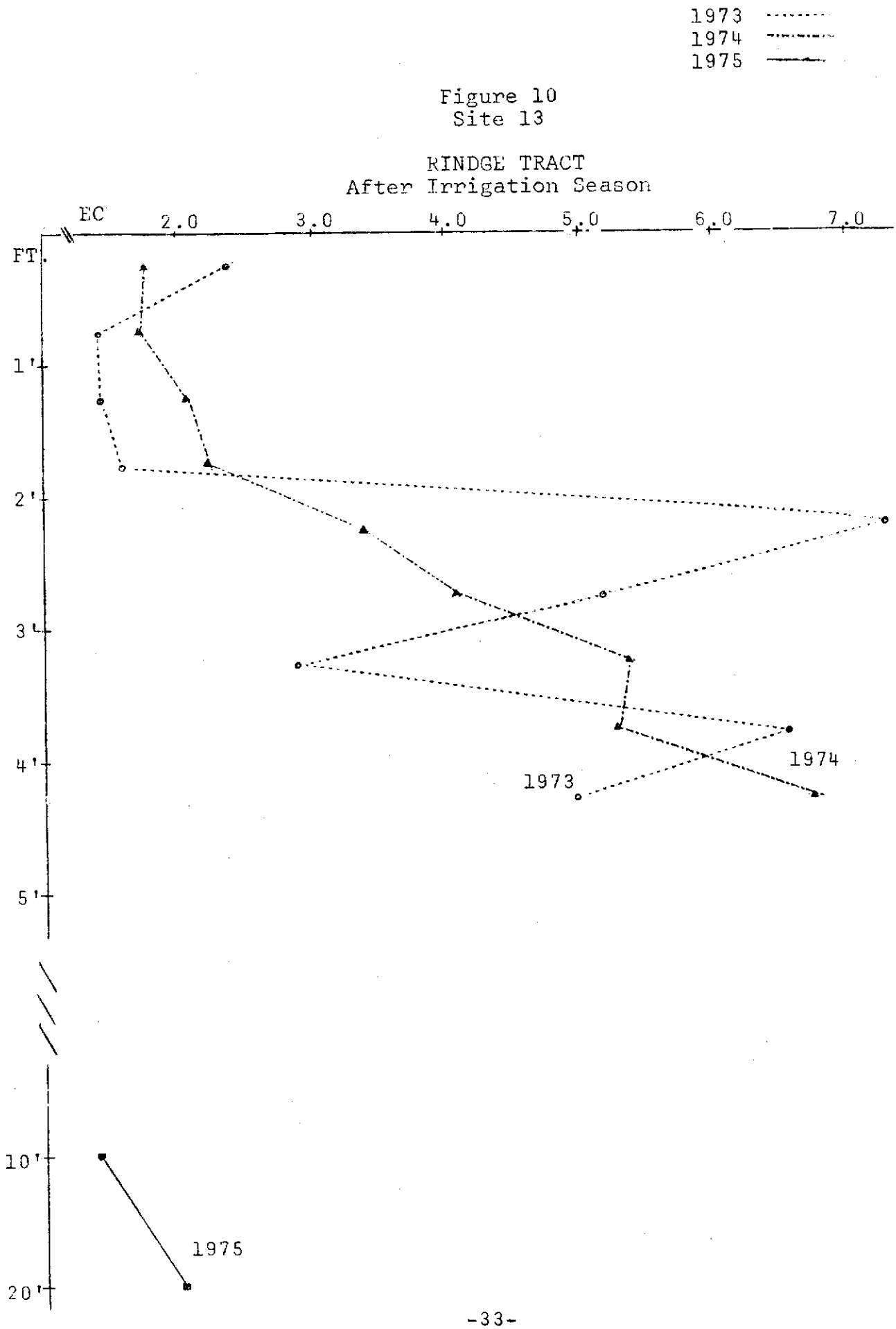


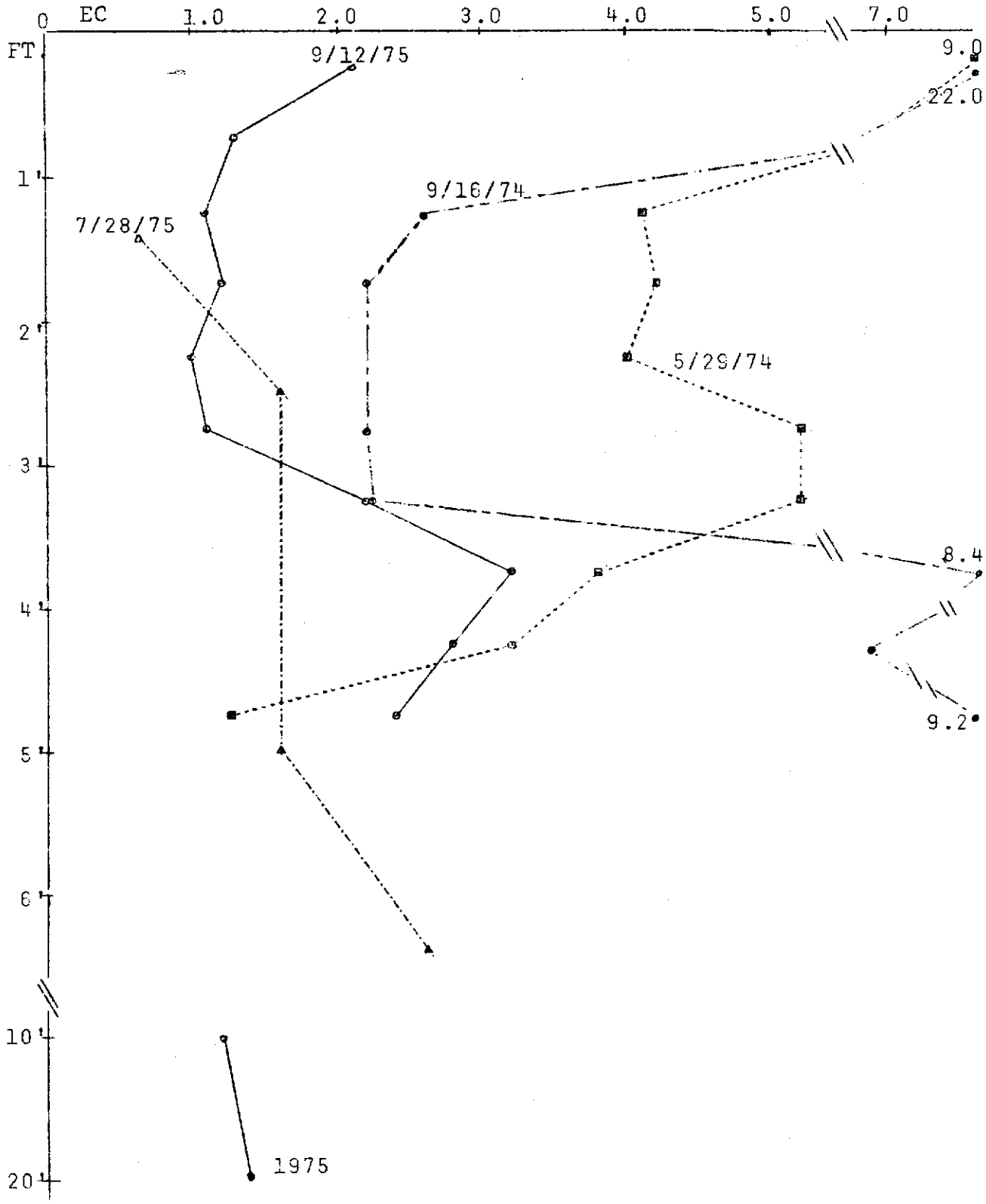
Figure 10
Site 13

RINDGE TRACT
After Irrigation Season

Before Irrig. 1974 .....
After Irrig. 1974 - - - -
Before Irrig. 1975 -.-.-
After Irrig. 1975 ——

Figure 11 - Site 23
SHERMAN ISLAND

Before/After Irrigation Season 1974
Before/After Irrigation Season 1975



DELTA ORGANIC SOIL SALINITY & NUTRIENT STATUS STUDY

Summary Report of Laboratory Analysis

J. L. Meyer - Alan Carlton

PURPOSE:

This preliminary investigation of the salt status in the delta was begun to observe salt distribution within the soil profile and movement during one season in organic soils. Various crops and water management practices in several areas of the delta to include subirrigation, furrow, sprinklers and flooding were used in the study.

Sites for study were selected on Bacon and Staten Islands; Terminous; Rio Blanco and Rindge Tracts. For ease of sample collection for this first year of study, the sites did not include islands of the western delta.

Crops selected were corn, tomatoes asparagus, sunflower, alfalfa and potatoes.

SITES AND HISTORY:

Twenty-two sites were selected for study. The following are a listing of the sites, crops and a brief crop and irrigation history at each location.

SITE	1973 CROP	LOCATION	IRRIGATION	CROP HISTORY
1	Asparagus	Bacon	Winter Flooded 10 years +	Asparagus since 1966
2	Asparagus	Terminous	Sprinkled 1971 - 1972	Asparagus - 1971 Corn - 1970
			Subirrigated (Spud Ditch) -1973	Barley - 1969 Tomatoes - 1968
3	Tomatoes	Rio Blanco	Furrow	Tomatoes - 1973 Tomatoes - 1972
4	Weeds	Terminous	Nonirrigated	Virgin Peat Soil

SITE	1973 CROP	LOCATION	IRRIGATION	CROP HISTORY
5	Potatoes	Bacon	Subirrigated (Spud Ditch)	Potatoes since 1971
6	"		"	"
7	Corn	Terminous	Subirrigated (Spud Ditch)	Corn - 1973
8	"		"	Sunflowers - 1972
9	"		"	Corn - 1971 Corn - 1970
10	Asparagus	Terminous	Sprinkled - 1973	Corn - 1972
11	Sunflowers	Terminous	Nonirrigated	Sunflowers - 1972
14	"			Sunflowers - 1971
15	"		Flooded winter of 1970-71	Corn - 1970
12	Alfalfa	Staten	Sprinkled since 1968	Alfalfa since 1968
			Subirrigated before 1968	Beets - 1967 Wheat - 1966 Corn - 1965
13	Corn	Rindge	Subirrigated (Spud Ditch)	Corn continuous since 1968
16	Potatoes	Bacon	Subirrigated (Spud Ditch)	Potatoes 1971 - 1973
17	"			
18	"		Flooded (winter) 1971 & 1973	
20	Fallow (Barley)	Staten	Nonirrigated (No Spud Ditch)	Flooded (fall - 1973) After Barley
21	"		"	"
22	"		"	"

METHODS:

Soil samples were collected at each site at the beginning of the 1973 crop season and after crop harvest. Samples were obtained at six-inch intervals into the water tables.

Soil analyses were determined in the San Joaquin County Agricultural Extension Laboratory on saturation extracts.

After initial soil samples were obtained, soil solution extraction probes were placed under the crops at six-inch increments of depth.

Soil solutions from the extraction probes were obtained throughout the growing season at approximately weekly intervals and were analyzed for the same constituents as the soil samples. The nutrients, nitrogen, phosphorus and potassium were analyzed on most of the extracted soil solutions by the University of California, Davis, Agricultural Extension Laboratory on the extracted soil solutions. Water table depths were monitored and irrigation water analyses made.

Analyses were pH, EC, $Ca^{++}+Mg^{++}$, $CO_3^{=}$, Cl^{-}, NO_3^{-}, NH_4^{+}-N,-N, PO_4^{-}, HCO_3^{-}, and K^{+}. Standard University of California Agricultural Extension methods were used. In the following discussion, the electrical conductivity of saturated extracts are EC_e and electrical conductivity of solutions from soil solution extraction probes are EC_{sw}.

RESULTS:

The soil salinity profiles are extremely complex in the delta. The large number of crops, soils, water and management schemes are each variables and interact with each other. Evaluation of one variable, water quality, as it affects soil salinity is difficult.

This one-year summer crop season investigation can only explore some of these variables. The following generalizations of the delta salinity status are inferred from the data of the 1973 samplings:

1. The present salinity levels vary (quantities and soil profile distribution) greatly in the delta.
2. Salinity in the organic soil study area was generally fairly low, mostly below the 2-4 mmho range in the saturation extract.
3. In general, soil salinity changed little during one growing season.
4. The total salinity and salt profile characteristics appear to be related more to prior history than one season's irrigation practices. Evidence indicates long-term sprinkling results in lower salt levels.
5. A given management practice, over a period of years, appears to produce a salinity profile unique to the particular management practice.
6. Salts do not appear to accumulate at or near the soil surface to the extent expected under high water table conditions as has been experienced with mineral soils.
7. Flooding for leaching purposes removed large quantities of salt and is more effective near operating drains.
8. The salinity profile under nonirrigated conditions can change considerably during a growing season and is apparently sensitive to the rooting habits of the plants.
9. Soil salinity (EC_e) and soil water extracts (EC_{sw}) cannot be used interchangeably.
10. Examinations of complete data (not shown in this brief summary) imply chlorides determined in saturation extracts or soil water solutions were not an indicator of total soil salinity as measured by electrical conductance, EC.

    This lack of correlation was found in this study under low salinity conditions and may not apply in higher salinities of other areas of the delta.

DISCUSSION:

The graphic presentation (Tables 1--6) of the delta data indicates the complexities of the delta soils and leads to the above conclusions. Following are comments on specific sites and practices. Sites not shown in the tables are similar to those presented, hence felt to be redundant for the purpose of this summary. The complete tabular data are contained in the separate report of laboratory analysis.

1. The geographic variations in soil salinity are demonstrated by a comparison of the tables. Comparing Table 3 to Table 4 shows the large variation from Site 10 with low salinity to Site 12 with very low soil salinity to a high salinity area represented by Site 13.
2. A comparison of soil salinity EC_e, at each depth in all the tables shows little change during 1973, except Table 6, Sites 20, 21 and 22 where leaching was purposefully done, and Table 5, Site 15, where nonirrigated sunflowers appear to concentrate salt at about 2 to 2-1/2 feet but depleted salt in the subsoil.
3. Site 12, Table 3, the Staten Island alfalfa, has been sprinkler irrigated for four years and shows a very low salt profile. By comparison, the adjacent subirrigated barley field, before leaching (Sites 20,21 and 22, Table 6) shows a moderately high soil salinity profile and the reason for leaching. The historic cropping pattern of corn with subirrigation is further reflected in the moderately high salinity status of Site 8, Table 2.

   This almost continuous corn crop site seems to demonstrate a stable salinity profile.
4. Sites where the same crops have been grown consistently for some years, for example, Sites 1, 5, 8 and 12, Tables 1, 2 and 3, show little seasonal change in 1973.

5. An examination of the sites shows no consistent salt accumulations in the surface soils. Site 5, Table 2, spud ditch irrigated potatoes, and Site 10, Table 3, nonirrigated asparagus, show a decline in salinity in the soil surface.

6. Sites 20, 21 and 22 in Table 6, show the large salt removal with leaching. Site 22, nearest to an operating drain, shows the largest salt removal below one-foot depth.

7. The virgin peat soil, Site 4, Table 1, shows the extent of water extraction by weeds from the deep profile and upward salt accumulation. Site 15, Table 5, also nonirrigated but under a sunflower crop, also shows some upward movement of salts.

8. The soil water extracts EC_{sw} did not correlate directly to soil sample EC_e.

The soil water extract profiles, Sites 1 and 4, Table 1, nonirrigated, shows very little relationship to soil salinity. Site 8, Table 2, shows no relationship of EC_{sw} to EC but an inverse relationship to saturation percentages of the soil (SP).

The subirrigated potatoes, Site 5, Table 2, demonstrate a soil water EC_{sw} change during irrigation, but a return to original EC_{sw} after the season and after the water table has fallen.

AUTHORS:

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DATA TABLES:

Tables 1 - 6 show soil salinity (EC_e) as bar graphs (▬▬▬) before the cropping season and EC_e as a broken bar (▮▮▮▮▮▮▮▮▮▮▮) following the cropping season, at six-inch increments of depth.

The water table range during the season is shown by a vertical bar--W.T. ≡, in the left hand column.

The approximate soil water extracts (EC_{sw}) are shown in some tables during the crop season with changes by directional arrows:

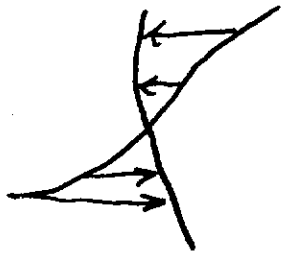
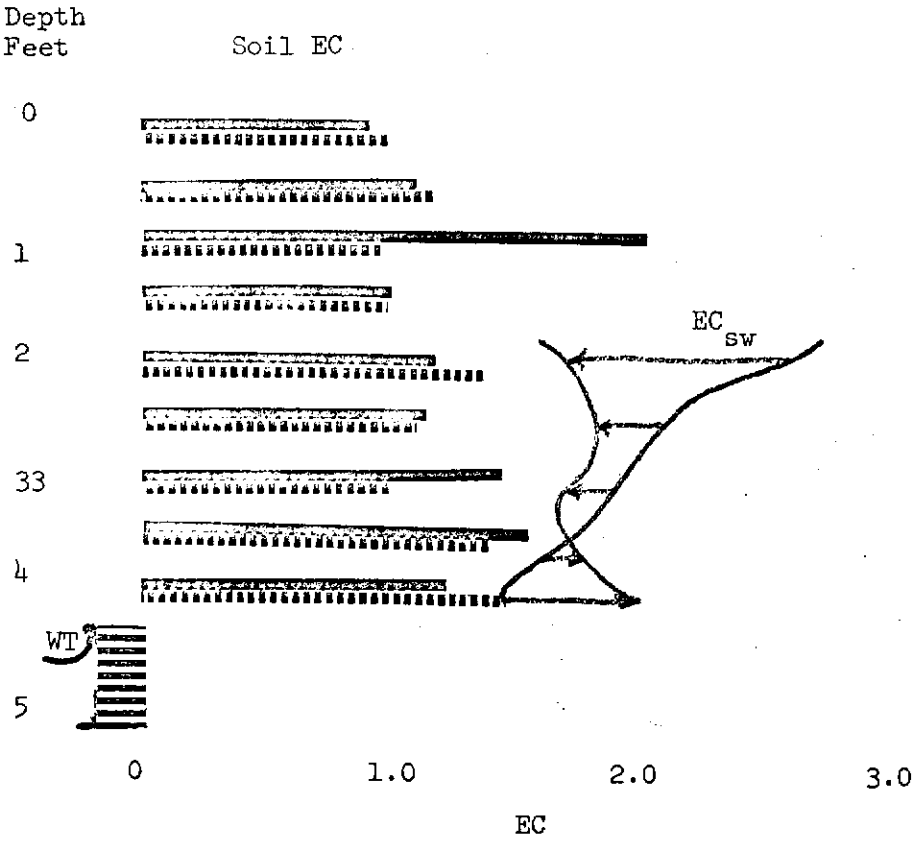


Table 1

Site 1 - Asparagus - Not Irrigated



Site 4 - Virgin Peat Soil - Not Irrigated

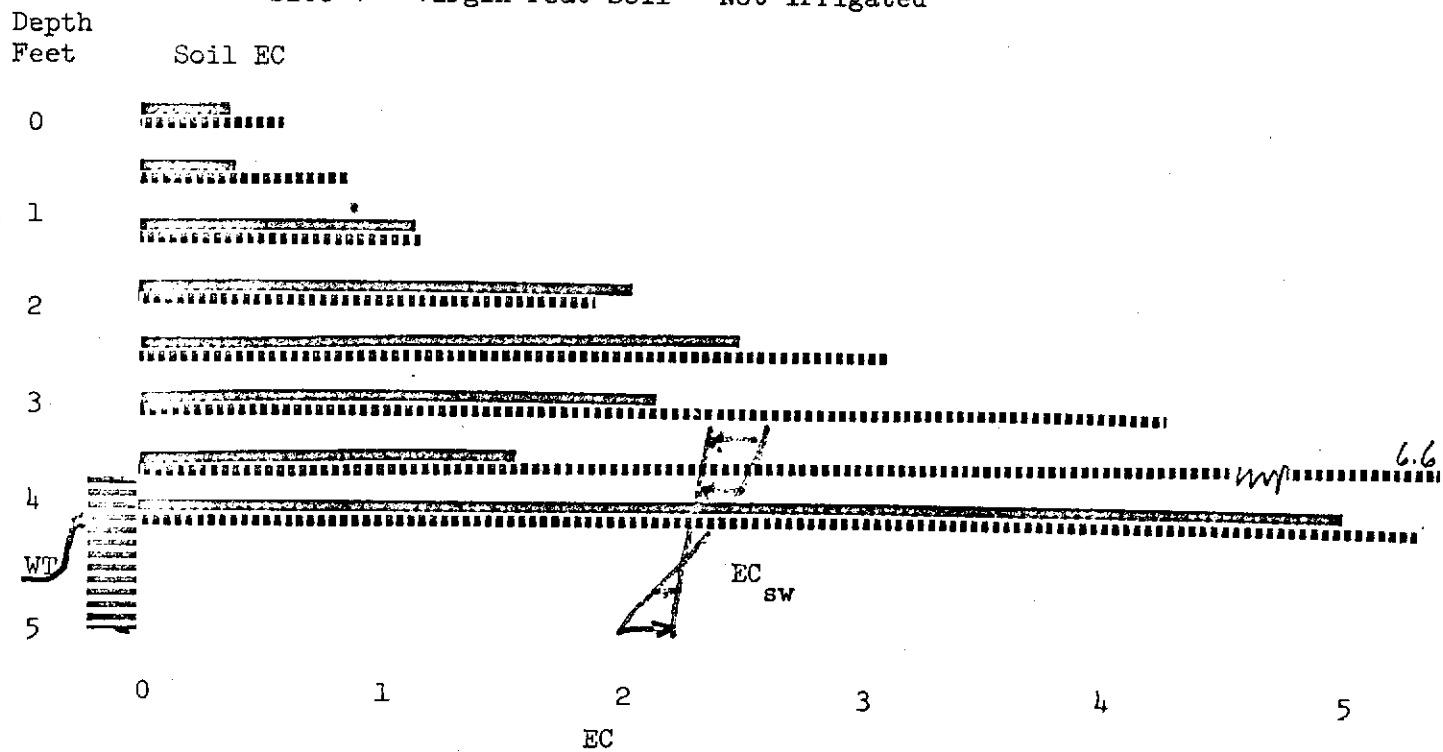
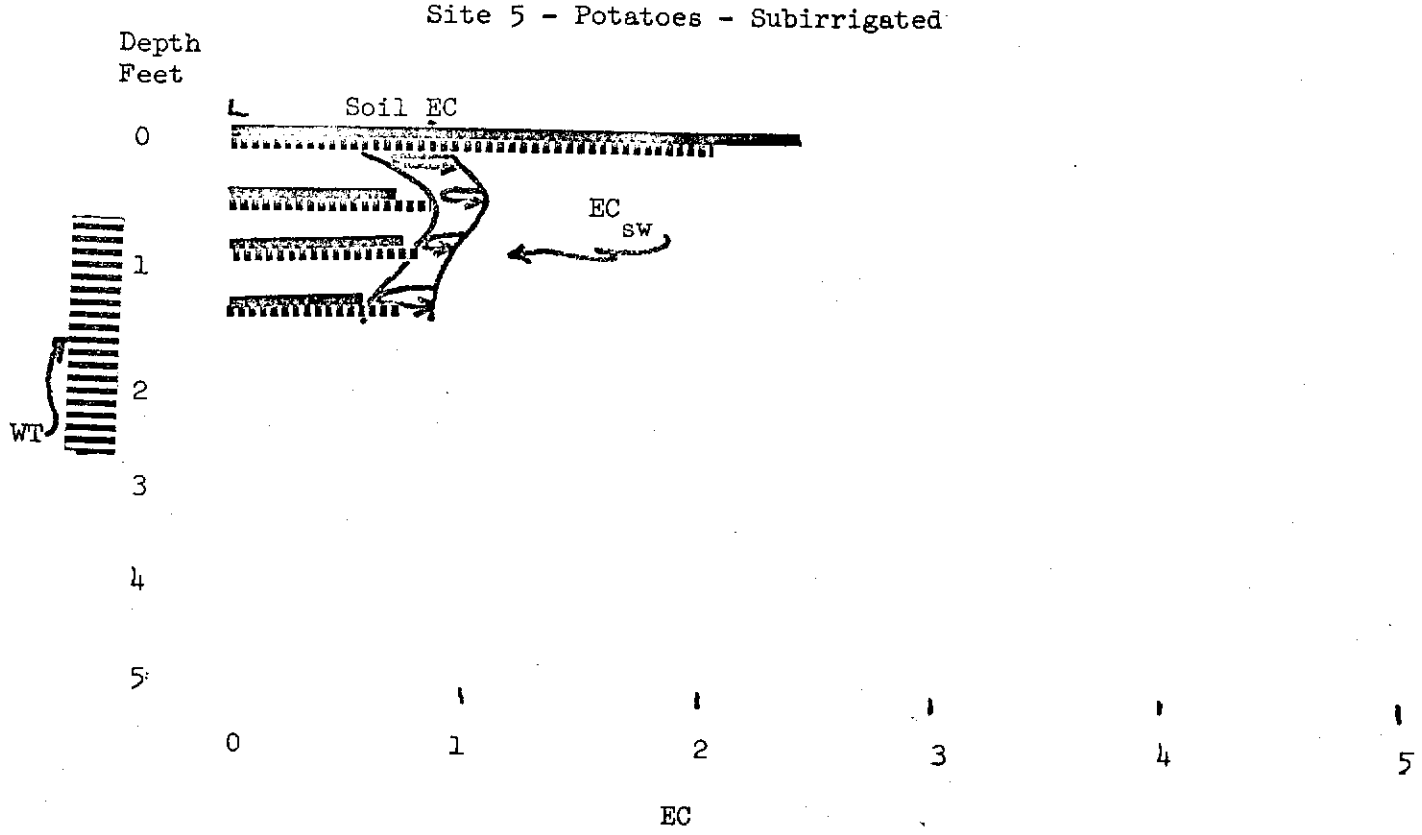


Table 2

Site 5 - Potatoes - Subirrigated



Site 8 - Corn - Subirrigated

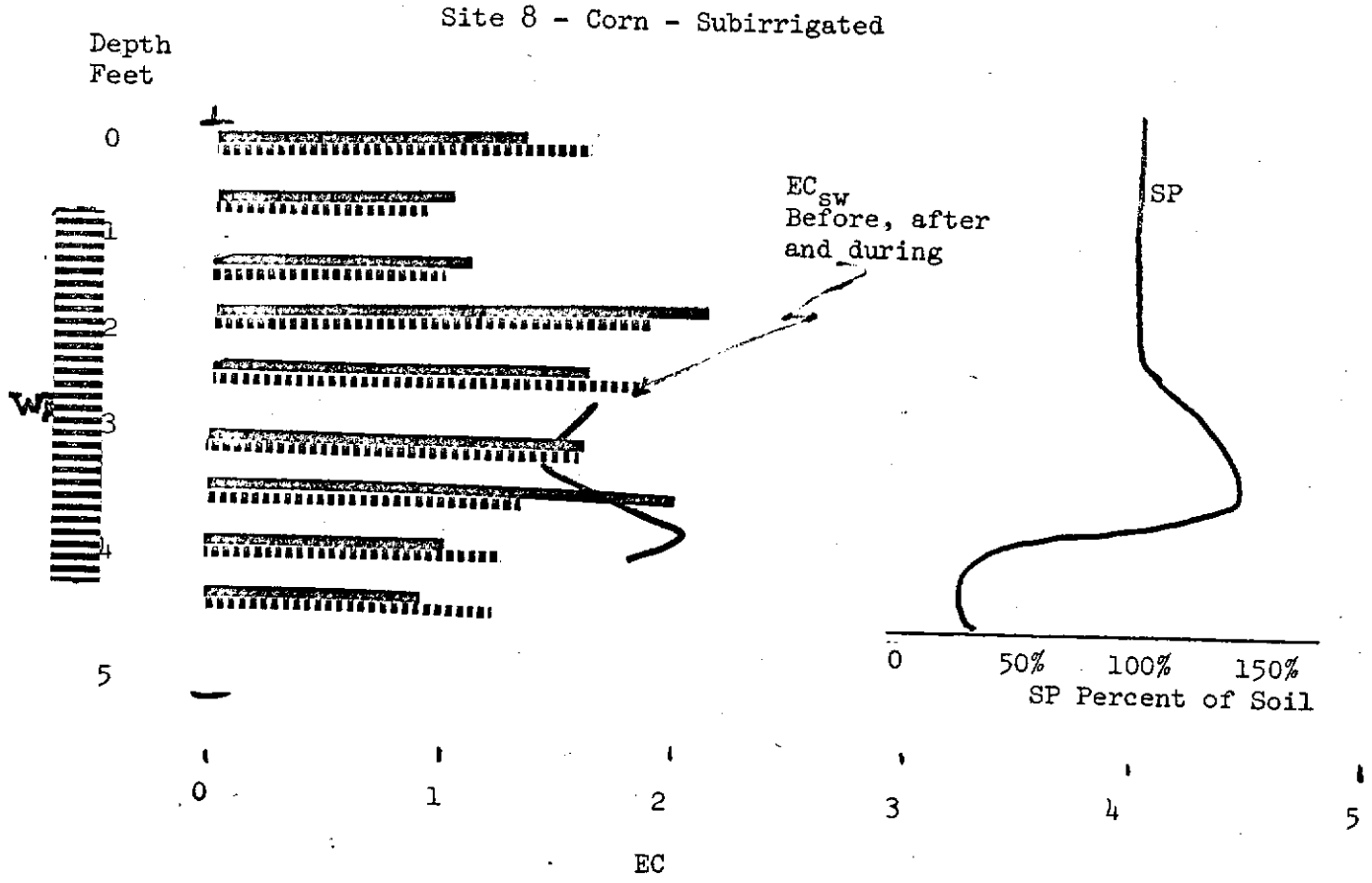
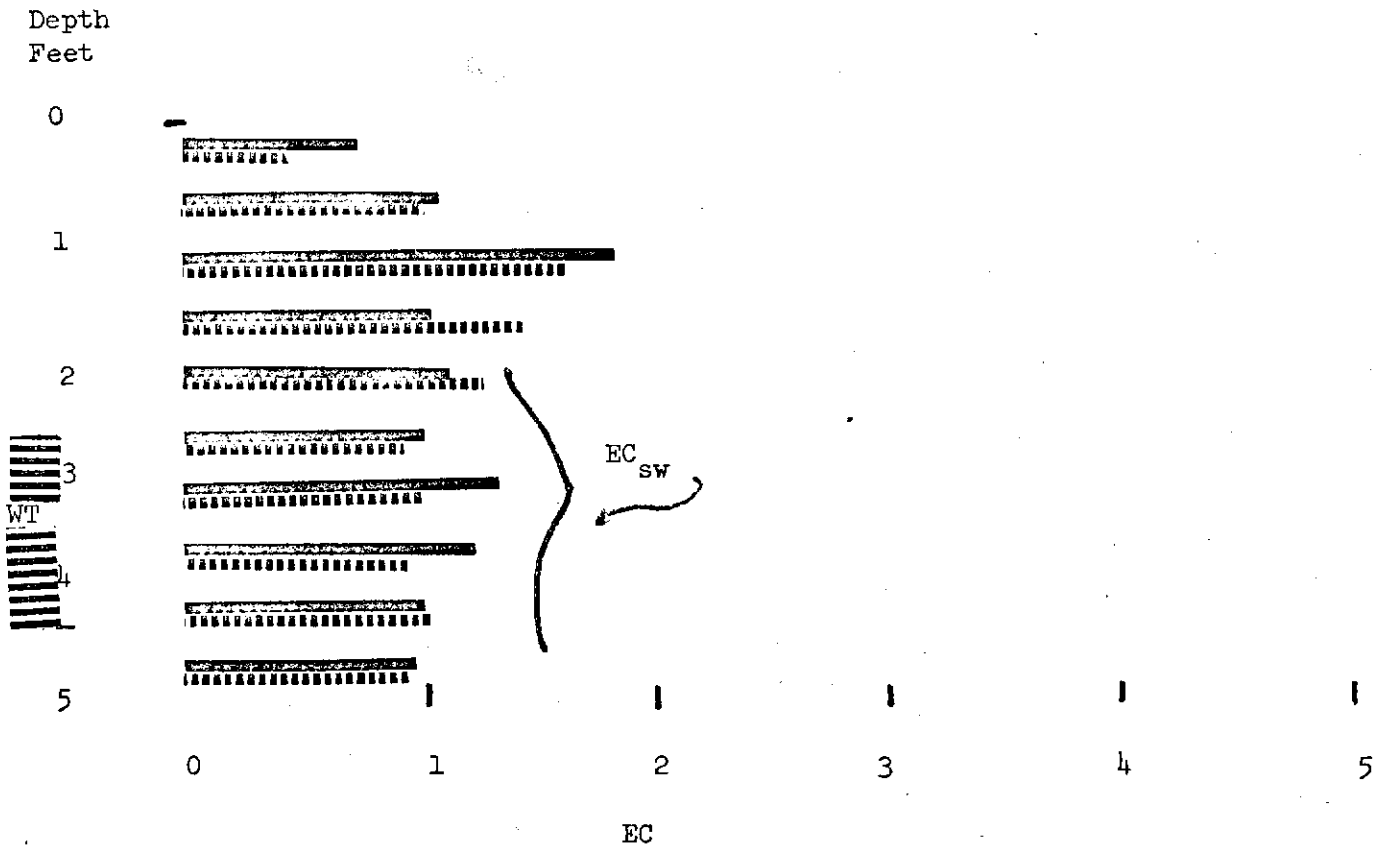


Table 3

Site 10 - Terminous - Asparagus Seedlings - Sprinkled (in 1973 only)



Site 12 - Staten - Alfalfa - Sprinkled (Since 1968)

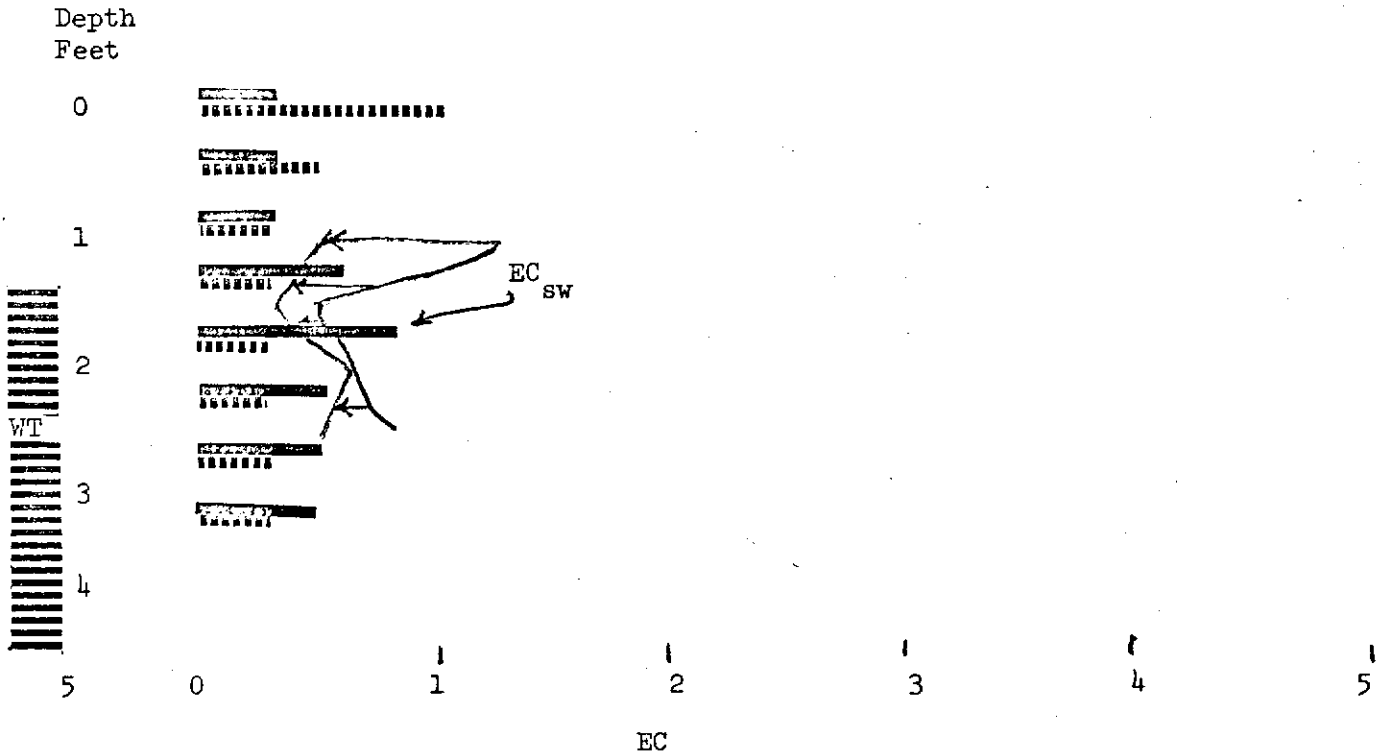
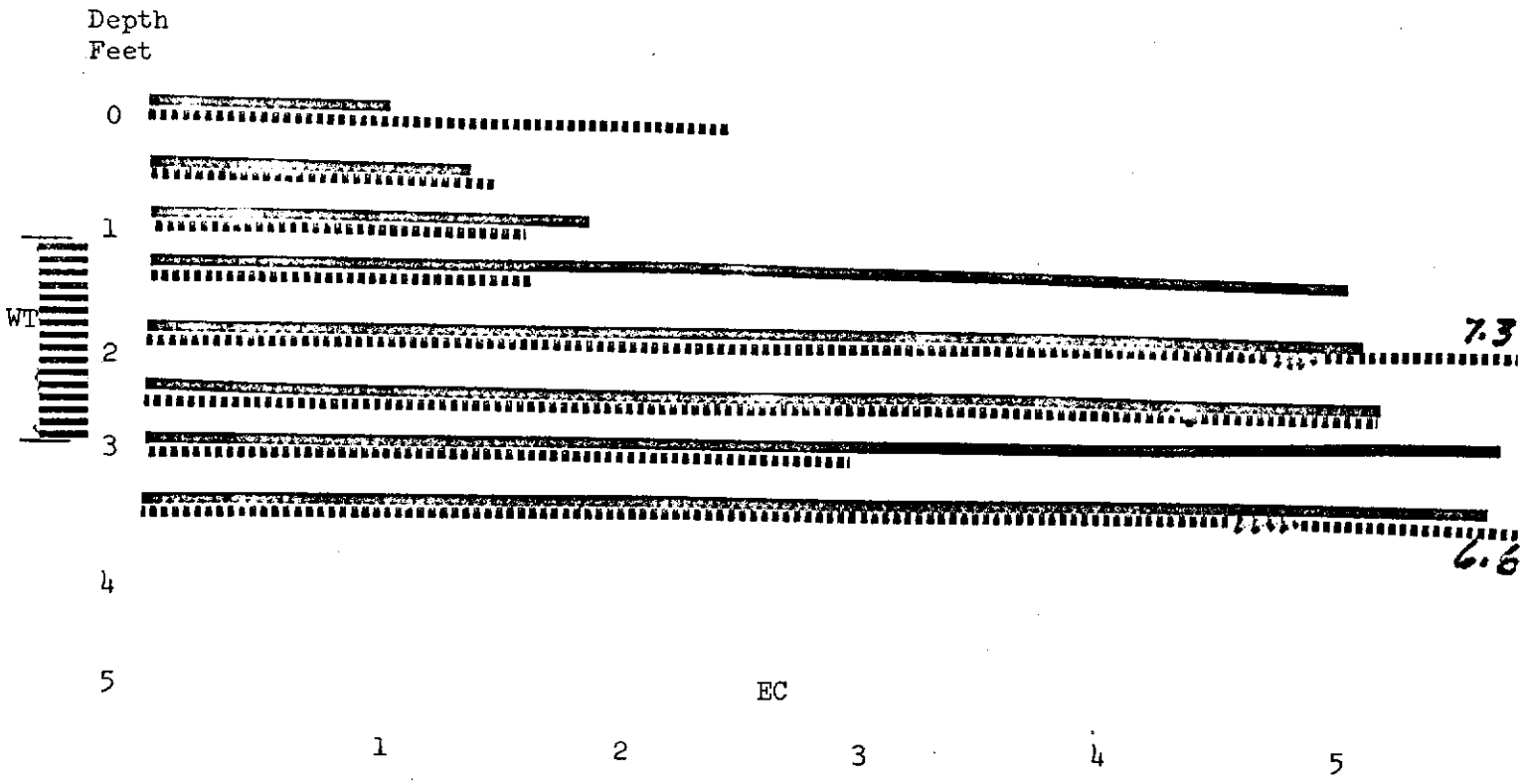


Table 4

Site 13 -. Rindge Tract - Corn - Subirrigated



Site 13

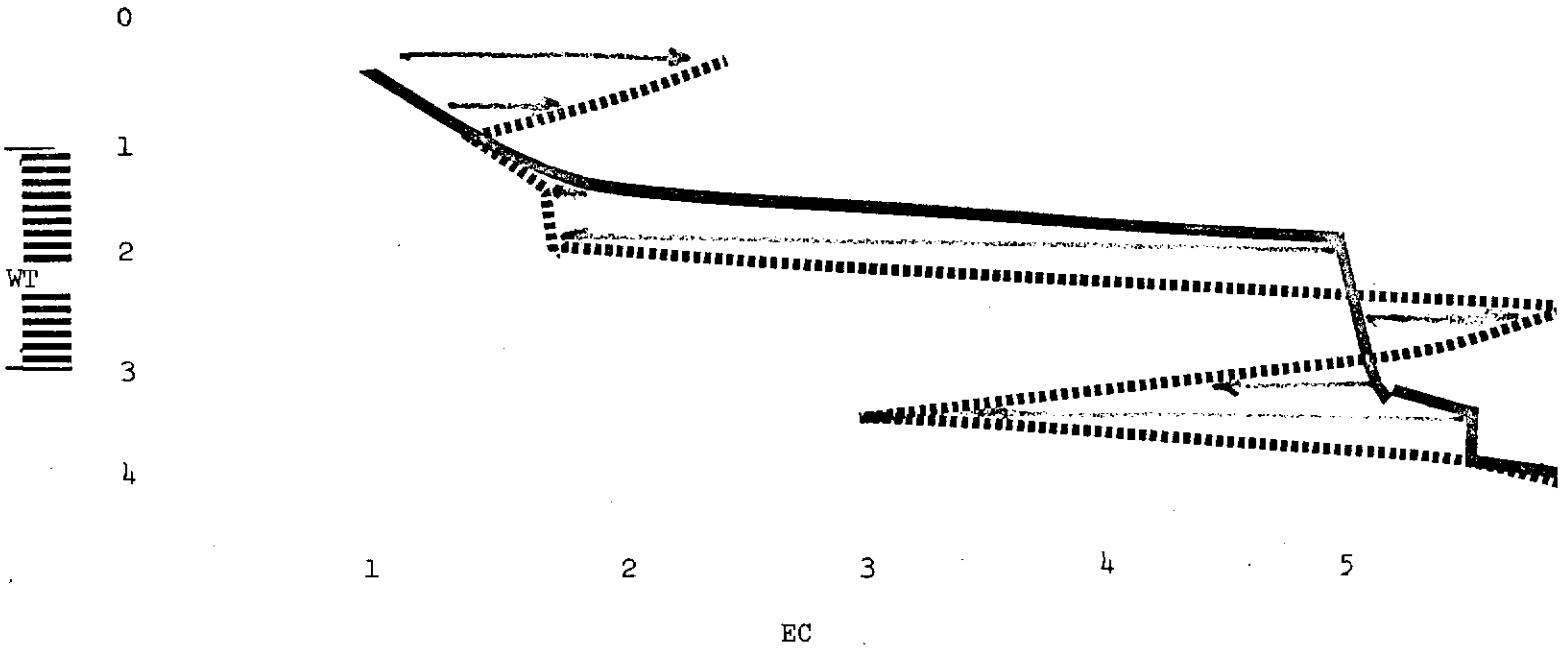
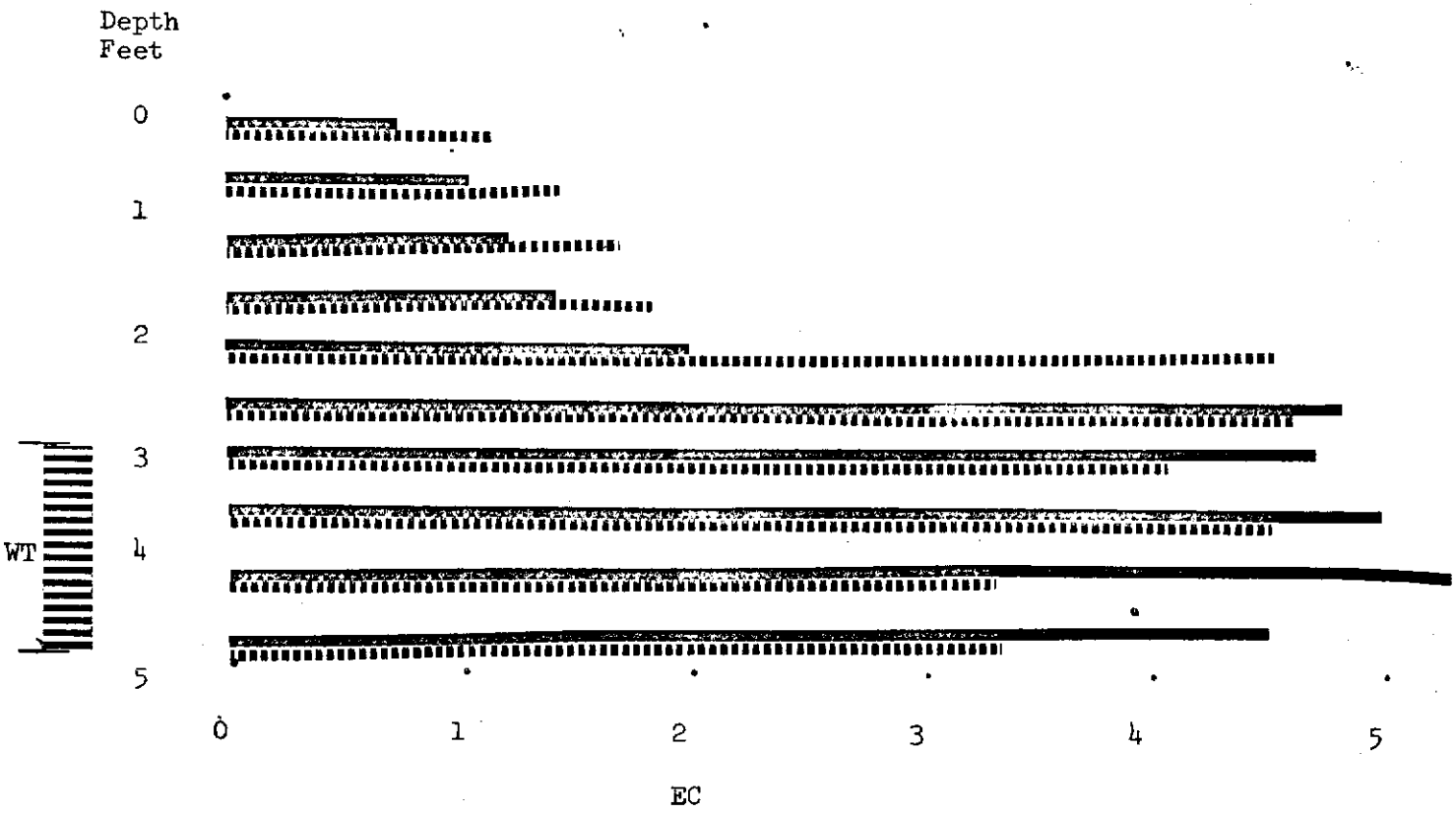


Table 5

Site 15 - Sunflower - Nonirrigated



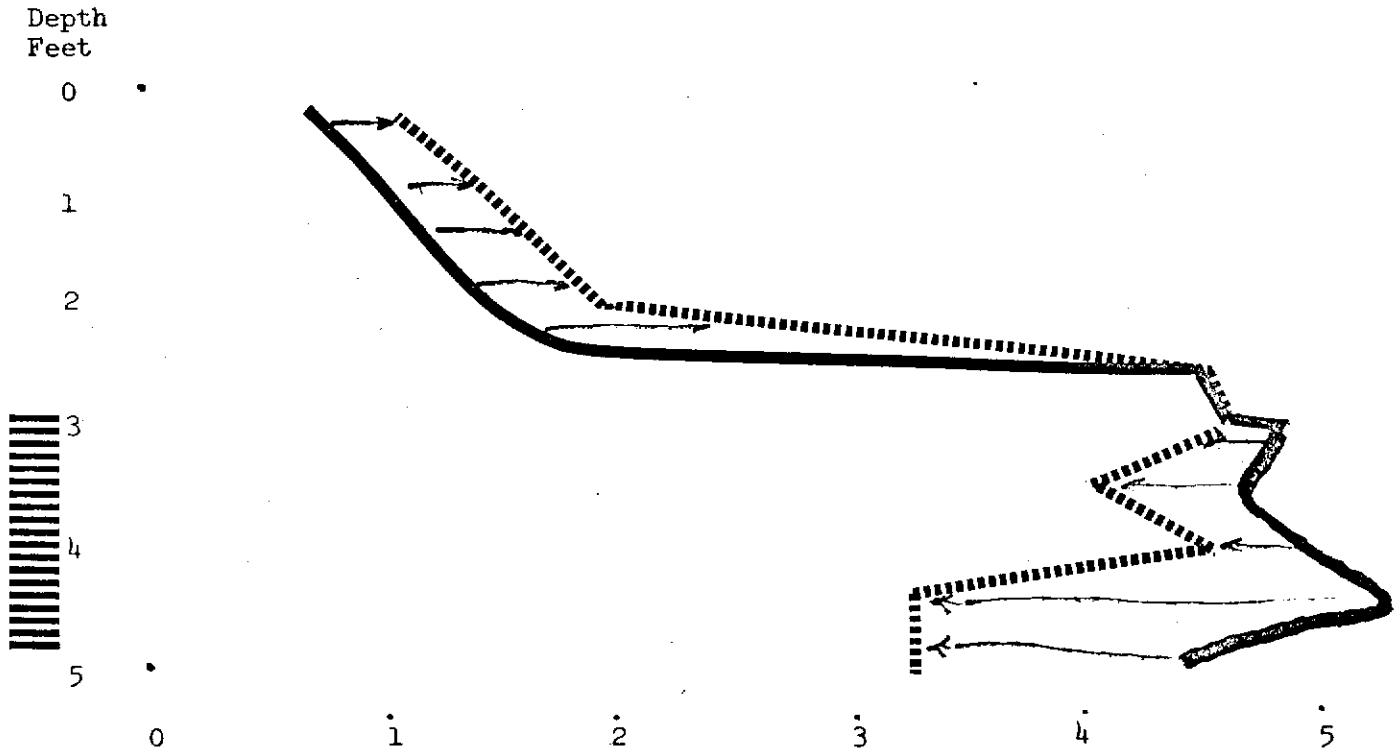
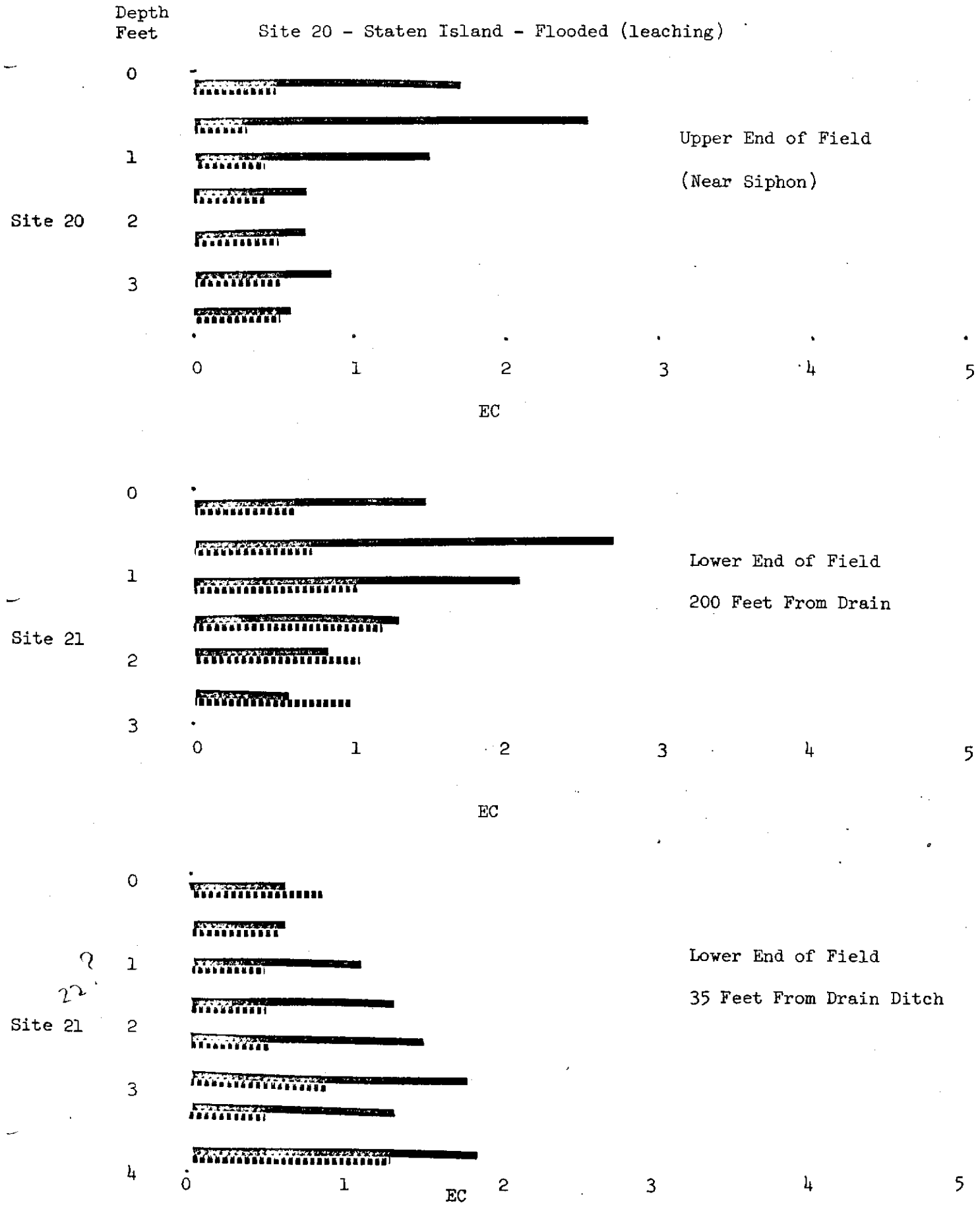


Table 6


Depth
Feet
Site 20 - Staten Island - Flooded (leaching)
0
1
2
3
Site 20
Upper End of Field
(Near Siphon)
0
1
2
3
4
5
EC
0
1
2
3
Site 21
Lower End of Field
200 Feet From Drain
0
1
2
3
4
5
EC
0
1
2
3
4
Site 21
Lower End of Field
35 Feet From Drain Ditch
0
1
2
3
4
5
EC