

Soil Fertility Status of Some Agricultural Areas in El -Kharaga Oasis, New Valley, Egypt

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Abstract:

Macro elements availability in soils is an important aspect in context of soil fertility and agricultural productivity. This study was performed to determine the levels of some macro elements availability in El-kharga oasis soils, New Valley, Egypt. To achieve this goal, hundred surface soil samples (0-30 cm) were collected from El-Kharga and Barisoasis, New Valley, Egypt. The collected soil samples were subjected for chemical analyses. The obtained results showed that the dominant problems are salinity and low organic matter content, The summarized data showed that 35% of the samples have low available nitrogen and 65% have medium nitrogen which was associated with low organic matter (100% of the samples have less than 1% OM). However 91% of the samples have high available P(>15mg/kg), where as 5% and 4% of the samples were categorized as low and medium available P. Also, 98% of the samples were high in available potassium and only 2% were medium. The high content of available P and K may be resulted from the parent material of El-kharga oasis. According to ECe, 49% of the samples have ECe less than 4dSm^{-1} , 51% of the samples were higher than 4dSm^{-1} , (21% medium, 16% high and 14% very high). Considering the soil pH and ECe, the results showed that 42% of the samples were non saline, 50% were saline, 6% were sodic soil and only 2% were saline sodic soils.

Keywords: El-kharga Oasis, New Valley, soil fertility and NPK.

Introduction:

The increasing world population is a day fact, and the need for increasing food production to overcome this problem is of great concern. In Egypt, most of the agricultural areas are concentrated in the Nile delta. Due to the intensive population growth, the current agricultural production is not adequate for human needs. Therefore, horizontal expanding is necessary to increase food production. New Valley Governorate is one of the largest governorates in Egypt; representing about 44% of the Egyptian total area (Ball, 1990; Gad *et al.*, 2016). However, the reclamation of soils in the New Valley is very limited, and con-

trolled mainly by the major physico-chemical soil characteristics which can be considered as the key answer for the suitability of the new reclaimed soils for agricultural (Gameh *et al.*, 2016). Several kinds of parent materials can be found in El-Kharga Oasis, i.e., alluvial deposits of the old terraces, clay shale deposits, sandstone that classified as the Nubian formation and the limestone rocks of the Eocene, Miocene and cretaceous ages (Gameh *et al.*, 2016). Soil characteristics is an important factor controlling soil fertility; for example, the previous studies demonstrated that the high coarse texture soils are always characterized by low soil ferti-

ity and low water holding capacity (Abdelhafez *et al.*, 2016). As a result, the productivity of such soil is very low without any applications of soil amendments. Furthermore, soil chemical characteristics in terms of soil reaction (pH), organic matter and nutrients availability, especially macro nutrients of N, P and K, are very important factors to determine soil fertility (Hartemink, 2010). The deficiency of nutrients is the major factor hindering the productivity and sustainability of soils (Bell and Dell, 2008). Several factors can control the availability of metal ions into the soil, for example, high soil reaction (pH) may lead to the precipitation of metal ion into hydroxide forms (Abdelhafez *et al.*, 2012). The main objective of the current study was to determine the availability of the major macro elements (N, P and K) in the soils of El-Kharga Oasis.

Materials and Methods:

There are five main oasis in the New Valley, namely, EL-kharga, Baris, Balat, El-Dakhla and EL-Farafra. In this study, samples were collected from the area between El-Kharga and Barisoasis. (Fig1 a and b). The climatic characteristics of study location are similar to that of Western Desert, which characterized by arid region, hot temperature and almost no precipitation. The average annual temperature is 25.42°C with great difference between summer and winter temperature. The maximum temperature (41.21°C) was recorded in August. The temperature during summer ranges between 22.69°C and 41.21°C, while in winter it varies between 7.52°C and 25.17°C., humidity

during summer and winter seasons are 24.97% and 49.79%, respectively.

El-kharga oasis is located 230km south of Assiut city and it is a longitude depression extended to 140km to the south and consisted of kharga and baris oasis with a variable narrow width of about 20km and variable elevation from 30m to 60m above sea level (Fig1 a and b).

The study location was divided into 4 major blocks of common villages in the distance between El-Kharga and Baris (Fig 2). A total number of 100 surface layers (0-30 Cm) were selected from the main agricultural farms in El-Kharga Oasis with avoidance of the non-cultivated soils. The collected soil samples were transferred to the laboratory for analysis. The study area were divided to four sections namely:

1- North El-Kharga which extend about 25km and was represented by 28 soil samples.

2- Center of El-kharga area which extend about 18km and was represented by 30 soil samples.

3- South El-khargaarea which extend to 41km and was represented by 31 soil samples.

4- Baris area wich extend about 35km and was represented by 11soil samples.

The collected soil samples were air dried, grounded and sieved to pass through a 2 mm sieve.

Soil pH was measured by pH meter in 1: 2.5 (Soil: Water) suspension using a glass electrode (Jackson, 1973). The electrical conductivity of the soil paste extract (ECe) was measured using electrical conductivity meter (Jackson, 1973). The organic matter content was determined

by modified Walkley and Black (Walkley and Black, 1934). Available nitrogen in the form of nitrate NO_3^- was measured by using the modified Micro-kjeldahl apparatus of Parnars and Wagner as described by Singh (1988) and ammonium NH_4^+ was measured by using the indophenol method as described by Selmer-Olsen (1971). Available phosphorus was extracted by (0.5 M) NaHCO_3 at pH

8.5 (Olsen *et al.*, 1954). Phosphorus was measured colorimetrically using the chlorostannousphosphomolybdic acid method (Jackson, 1973) using spectrophotometer at wavelength 660 nm. Available potassium was extracted by (1 N) NH_4OAc at pH 7.0 as described by (Jackson, 1973), and then was measured using flame photometer.

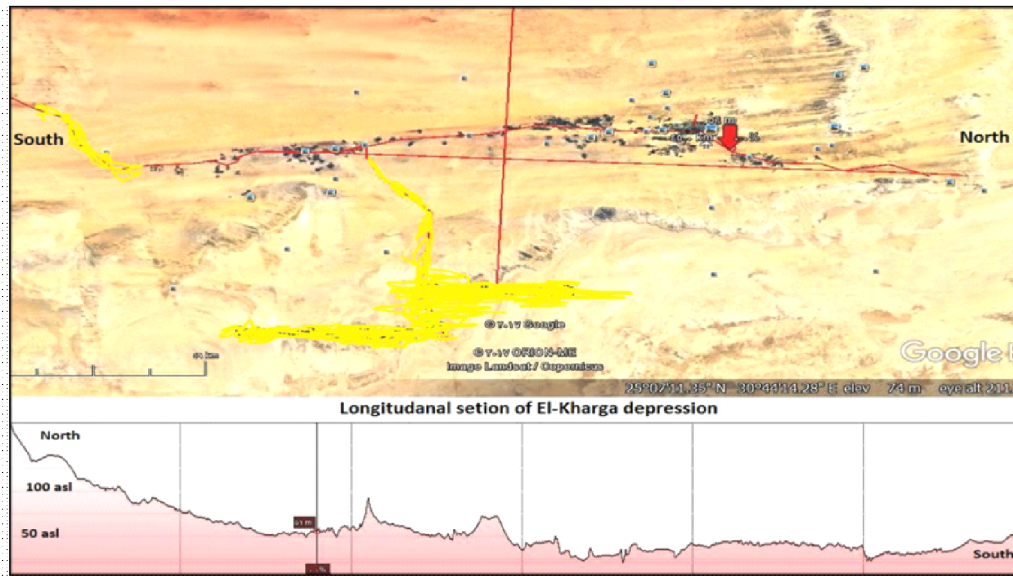


Figure 1-a : longitudinal section of El-Kharga depression

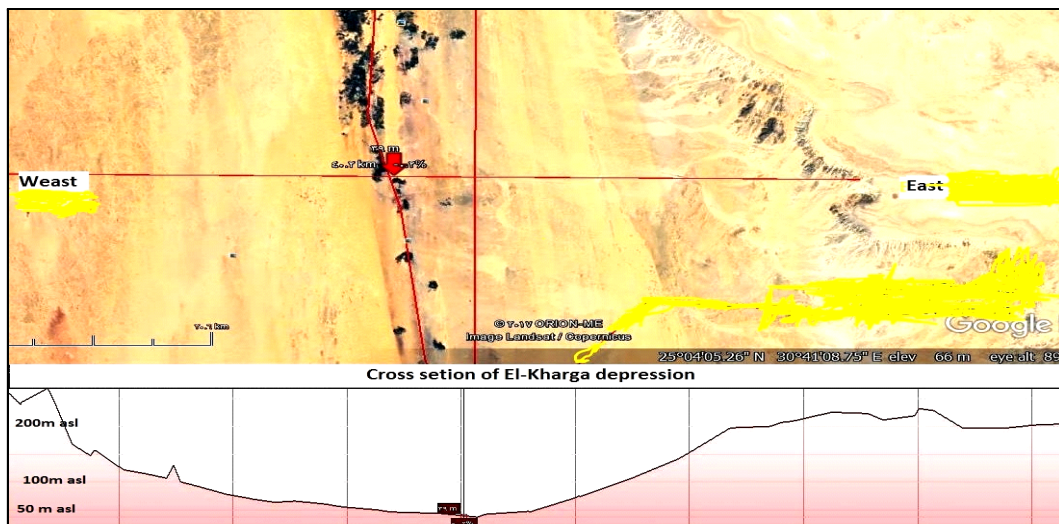


Figure 1-b : Cross section of El-Kharga depression

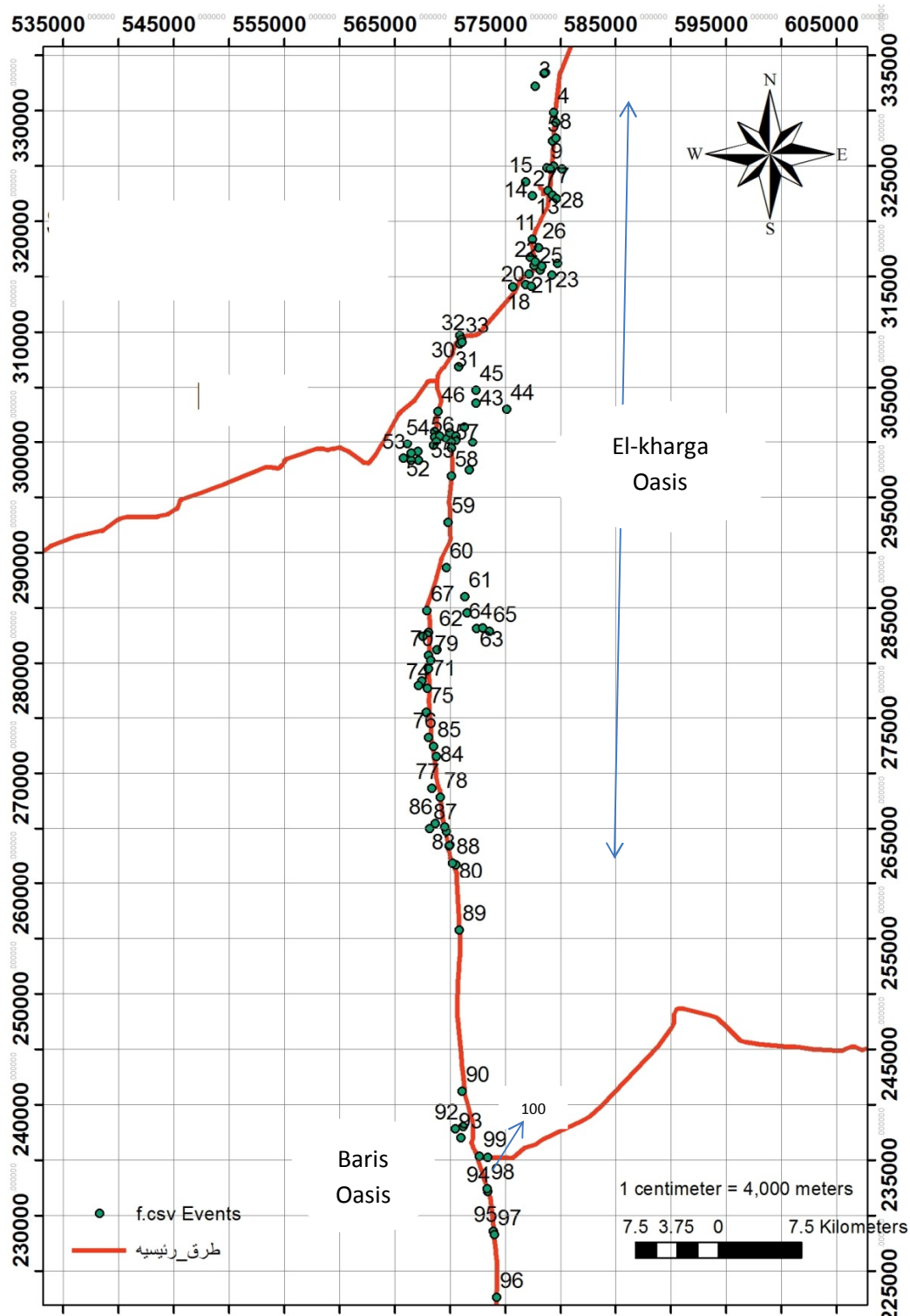


Figure2: El-kharga – locations of the collected soil samples.

The soil fertility was estimated depending on the criterion published by different authors as show in Table(1).

Table 1. Rating limits for Soil Testing Values Used in Egypt.

| Salinity levels | low | Medium | High | Very High | (Richards,1954) |
|---------------------------------------|------|-----------|--------|-----------------------------|-----------------|
| EC _e (dSm ⁻¹) | <4 | 4 - 8 | 8 - 16 | >16 | |
| Fertility levels | low | Medium | High | | |
| O.M% | <1.0 | 1.0 - 2.5 | >2.5 | (Bakr <i>et al.</i> , 1999) | |
| Available N ppm | <40 | 40 – 80 | >80 | | |
| Available P ppm | <10 | 10 – 15 | >15 | | |
| Available K ppm | <150 | 150 – 250 | >250 | | |

Results and Discussions

To evaluate soil fertility the soil fertility parameters were used by the Egyptian authorities as reported in (Table 1) according to Richards (1954) and Baker *et al.*, (1999). Six parameters (Soil acidity, electrical conductivity of the saturated paste extract, organic matter and available nitrogen, phosphorus and potassium) were used to evaluate soil fertility of El- kharga oasis soils.

The summarized data in (Table 2) showed that 35% of the soil samples have low available nitrogen and 65% have medium nitrogen that was associated with low organic matter

(100% of the samples have less than 1%).

However, 91% of the samples have high available P(>15mg/kg) and 5% and 4% of the samples were categorized as low and medium available P respectively. Also, 98% of the samples were high in available potassium and only 2% were medium. The high P, K may be resulted from the parent material of El-Kharga oasis. According to EC_e, 49% of the samples have EC_e less than 4ds/m, 51% of the samples were higher than 4ds/m (21% medium, 16% high and 14% very high).

Table 2. General Soil Fertility Parameters of El-kharga Oasis, New Valley;

| | pH | EC _e dSm ⁻¹ | % O.M. | Available macro nutrients | | |
|-----------------|-----|-----------------------------------|---------------|---------------------------|------------------|-------|
| | | | | N ppm | P ppm | K ppm |
| Min | 6 | 0.68 | 0 | 18.78 | 3.48 | 223.1 |
| Max | 8.8 | 112.1 | 0.76 | 72.3 | 37.3 | 494.7 |
| Mean | 7.9 | 9.01 | 0.14 | 48.7 | 24.3 | 345.9 |
| | | LOW | MEDIUM | HIGH | Very High | |
| Available N | | 35% | 65% | 0 | | |
| Available P | | 5% | 4% | 91% | | |
| Available K | | 0 | 2% | 98% | | |
| O.M | | 100% | 0 | 0 | | |
| EC _e | | 49% | 21% | 16% | 14% | |

The results of this study will be discussed for each of the four parts of El-kharga –Baris line as it follows:

1- North of El-kharga area

Most of the investigated areas had available nitrogen lower than 40ppm (60.7%) where as 39.3% have medium level (40-80ppm). This is associated with very low content of organic matter (100% of the area has less than 1%). The availability of P and K were astonishing, 96.4% and 92.9% of the area have high available P and K, respectively (Table 3). Only 3.6% of the area had low available P while 7.1 % had medium available K. The EC_e of the area is a major problem where only 39.3% of the area have low EC_e (<4ds/m), while 17.8%, 28.6% and 14.3% of the samples had medium, high and very high EC_e , respectively.

2- Center of El-kharga area:

The observed results of the center area of El-Kharga showed that the 36.7% and 63.3 % of the samples were low and medium in available nitrogen content, respectively. Most of the samples collected from the center of El-Kharga (86.7%) contained high values of available P, (Table 4). Where as 10% and 3.33% of the area contained low and medium levels respectively. 100% of this area contained high level of available potassium, while 56.7, 10%, 13.3%,

20% of the samples were low, medium, high and very high in EC_e content, respectively.

3- South of El-kharga area:

The available nitrogen in 16.1% of the investigated area were low where as 83.9 % of the area contained medium range of available N. Most of the investigated area (93.55%) contained high levels of available P, while only 6.45% contained medium levels (Table 5). All the area under investigation (100%) contained high level of available potassium. The EC_e content in the discussed samples ranged between low, medium, high and very high in 41.94%, 32.26%, 12.9% and 12.9% of the investigated area.

4-Baris area:

Available nitrogen in the area 18.8% is low and 81.82 % is in the medium range, availability of P was 9.1% low P, 9.1% was medium and 81.8 high available P (Table 6). 100% of this area was high level of available potassium. 72.7% of sample was low EC_e 27.3 % was medium EC_e , 12.9% high EC_e and 12.9% very high.

Generally salts and salinity problems and low organic matter are the dominant problem, while available nitrogen is low to medium, but phosphorus and potassium are in high levels. (Table 2)

Table 3. Soil fertility parameter of North El-kharga Oasis

| Sample NO | pH | EC _e dSm ⁻¹ | % O.M. | Available macro nutrients | | |
|-----------------|------|-----------------------------------|--------|---------------------------|-------------|------------------|
| | | | | N ppm | P ppm | K ppm |
| S1 | 7.5 | 74.17 VH | 0 L | 47.79 M | 25.88 H | 368.6 H |
| S2 | 7.7 | 10 H | 0 L | 48.45 M | 18.74 H | 475.3 H |
| S3 | 7.8 | 3.5 L | 0.29 L | 46.93 M | 6.34 L | 320.1 H |
| S4 | 7.8 | 7.14 M | 0 L | 37.42 L | 26.32 H | 349.2 H |
| S5 | 8.2 | 2.42 L | 0.19 L | 36.86 L | 23.9 H | 388 H |
| S6 | 7.9 | 8.13 H | 0 L | 18.95 L | 29.02 H | 242.5 M |
| S7 | 8.3 | 5.15 M | 0 L | 47.32 M | 28.92 H | 329.8 H |
| S8 | 7.7 | 20 VH | 0 L | 48.08 M | 23.28 H | 320.1 H |
| S9 | 8.1 | 9.63 H | 0.29 L | 24.71 L | 35.92 H | 223.1 M |
| S10 | 8.1 | 15.63 H | 0.57 L | 66.1 M | 33.88 H | 291 H |
| S11 | 8.6 | 3.13 L | 0.19 L | 36.1 L | 28.68 H | 465.6 H |
| S12 | 8 | 0.91 L | 0.19 L | 66.52 M | 27.14 H | 349.2 H |
| S13 | 8.3 | 1.90 L | 0.57 L | 68.53 M | 27.1 H | 252.2 H |
| S14 | 8.3 | 1.65 L | 0.38 L | 67.78 M | 22.7 H | 446.2 H |
| S15 | 7.9 | 9.38 H | 0.38 L | 67.32 M | 27.72 H | 485 H |
| S16 | 7.8 | 2.95 L | 0.76 L | 21.89 L | 36.56 H | 349.2 H |
| S17 | 8.7 | 2.14 L | 0.67 L | 19.63 L | 18.78 H | 494.7 H |
| S18 | 7.85 | 9.17 H | 0.48 L | 22.37 L | 34.3 H | 349.2 H |
| S19 | 8.1 | 4.32 M | 0.76 L | 21.07 L | 26.78 H | 455.9 H |
| S20 | 8.55 | 1.77 L | 0.57 L | 20.41 L | 32.4 H | 426.8 H |
| S21 | 8.3 | 25 VH | 0.38 L | 23.48 L | 12.48 H | 417.1 H |
| S22 | 8.3 | 12.65 H | 0 L | 22.9 L | 22.66 H | 388 H |
| S23 | 8.1 | 4.33 M | 0.38 L | 24.05 L | 23.62 H | 252.2 H |
| S24 | 7.8 | 11.5 H | 0 L | 46.51 M | 20.72 H | 252.2 H |
| S25 | 8.5 | 6.38 M | 0.38 L | 25.29 L | 27.94 H | 291 H |
| S26 | 8.3 | 112.14 VH | 0 L | 26.33 L | 19.72 H | 339.5 H |
| S27 | 8.8 | 2.1 L | 0 L | 25.8 L | 21.86 H | 291 H |
| S28 | 8.4 | 3.8 L | 0 L | 24.73 L | 28.3 H | 310.4 H |
| Min | 7.5 | 0.91 | 0 | 18.95 | 6.34 | 223.1 |
| Max | 8.8 | 112.1 | 0.76 | 68.53 | 36.56 | 494.7 |
| mean | 8.1 | 16.1 | 0.27 | 38.03 | 25.152 | 354.7 |
| | | LOW | | MEDIUM | HIGH | Very high |
| AvailableN | | 60.7% | | 39.29% | 0 | |
| Available P | | 3.57% | | 0 | 96.43% | |
| Available K | | 0% | | 7.14% | 92.86% | |
| O.M | | 100% | | 0 | 0 | |
| EC _e | | 39.3% | | 17.86% | 28.6% | 14.3% |

Table 4. Soil fertility parameters of center El- Kharga oasis

| S.NO | pH | ECe dSm ⁻¹ | % O.M. | available macro nutrients | | |
|--------------------|------|--------------------------|---------------|---------------------------|------------------|--------|
| | | | | Nppm | Pppm | Kppm |
| S29 | 7.9 | 11.67 H | 0.38 L | 29.3 L | 37.32 H | 272 H |
| S30 | 7.9 | 1.21 L | 0 L | 31.12 L | 23 H | 252 H |
| S31 | 7.7 | 0.68 L | 0.57 L | 30.56L | 31.04 H | 291 H |
| S32 | 8.75 | 4.46 M | 0 L | 31.79 L | 23.34 H | 291 H |
| S33 | 8.7 | 1.36 L | 0 L | 29.98 L | 33.6 H | 310 H |
| S34 | 7.7 | 19.1 VH | 0 L | 48.81 M | 21.56 H | 446 H |
| S35 | 7.7 | 2.1 L | 0 L | 57 M | 9.34 L | 437 H |
| S36 | 7.6 | 17.22 VH | 0 L | 34.19 L | 27.14 H | 388 H |
| S37 | 8.12 | 2.35 L | 0 L | 33.62 L | 31.16 H | 359 H |
| S38 | 7.95 | 2.92 L | 0 L | 58.41 M | 36.3 H | 378 H |
| S39 | 7.5 | 20.73 VH | 0.38 L | 59.19 M | 21 H | 427 H |
| S40 | 7.4 | 18.24 VH | 0.38 L | 57.93 M | 24.7 H | 340 H |
| S41 | 7.7 | 1.88 L | 0.38 L | 60.1 M | 20.9 H | 427 H |
| S42 | 7.7 | 2.38 L | 0 L | 59.62 M | 29.64 H | 388 H |
| S43 | 7.7 | 9.46 H | 0.38 L | 58.79 M | 25.12 H | 252 H |
| S44 | 7.95 | 53.76 VH | 0.38 L | 57.5 M | 22.5 H | 291 H |
| S45 | 6 | 15.53 H | 0.19 L | 51.12 M | 17.62 H | 301 H |
| S46 | 7.5 | 2.35 L | 0 L | 68.16 M | 27.62 H | 349 H |
| S47 | 7.6 | 3.45 L | 0.38 L | 66.95 M | 29.32 H | 407.4H |
| S48 | 8.3 | 1.93 L | 0 L | 27.59 L | 5.74 L | 349.2H |
| S49 | 7.7 | 3.99 L | 0.38 L | 18.78 L | 22.54 H | 426.8H |
| S50 | 7.7 | 3.11 L | 0 L | 49.19 M | 31.3 H | 407.4H |
| S51 | 8 | 5.46 M | 0 L | 28.1L | 11.72 M | 446.2H |
| S52 | 7.8 | 2.50 L | 0 L | 50.37 M | 23.62 H | 388 H |
| S53 | 8.1 | 3.31 L | 0 L | 26.92 L | 27 H | 388 H |
| S54 | 8.15 | 29.23 VH | 0 L | 49.57 M | 27.24 H | 358.9H |
| S55 | 7.9 | 5.16 M | 0 L | 50.76 M | 20.58 H | 349.2H |
| S56 | 7.5 | 1.53 L | 0 L | 49.98 M | 31.64 H | 368.6H |
| S57 | 7.8 | 2.71 L | 0 L | 51.84 M | 30.36 H | 271.6H |
| S58 | 7.7 | 9.42 H | 0 L | 52.5 M | 9.76 L | 291 H |
| Min | 6 | 0.68 | 0 | 18.78 | 5.74 | 252.2 |
| max | 8.75 | 53.76 | 0.57 | 68.16 | 37.32 | 446.2 |
| mean | 7.79 | 8.64 | 0.13 | 45.99 | 24.46 | 355.02 |
| 30 sample | | LOW | MEDIUM | HIGH | Very High | |
| Available N | | 36.7% | 63.33% | 0% | | |
| Available P | | 10% | 3.33% | 86.7% | | |
| Available K | | 0 | 0 | 100% | | |
| O.M | | 100% | 0 | 0 | | |
| ECe | | 56.7% | 10% | 13.33% | | 20% |

Table 5. Soil fertility parameters of south E-I Kharga oasis

| Sample No. | pH | ECe dSm ⁻¹ | % O.M. | available macro nutrients | | |
|-------------|------|-----------------------|---------------|---------------------------|------------------|---------|
| | | | | Nppm | Pppm | Kppm |
| S59 | 7.95 | 4.45 M | 0 L | 52.17 M | 34.12 H | 368.6 H |
| S60 | 8.2 | 1.94 L | 0 L | 51.43 M | 11.44 M | 329.8 H |
| S61 | 8 | 3.87 L | 0 L | 68.94 M | 28.72 H | 300.7 H |
| S62 | 7.3 | 2.4 L | 0 L | 70.39 M | 20.36 H | 320.1 H |
| S63 | 7.7 | 4.51 M | 0 L | 71.6 M | 26.36 H | 310.4 H |
| S64 | 7.3 | 4.29 M | 0 L | 69.35 M | 27.72 H | 349.2 H |
| S65 | 8.1 | 1.95 L | 0 L | 70.82 M | 25.78 H | 281.3 H |
| S66 | 7.41 | 24.5 VH | 0 L | 71.93 M | 25.38 H | 291 H |
| S67 | 7.9 | 6.54 M | 0 L | 69.71 M | 19.18 H | 329.8 H |
| S68 | 7.7 | 16.43 VH | 0 L | 71.18 M | 25 H | 300.7 H |
| S69 | 8.2 | 1.8 L | 0 L | 72.29 M | 33.88 H | 261.9 H |
| S70 | 7.7 | 1.9 L | 0.19 L | 70.05 M | 12.24 H | 310.4 H |
| S71 | 8.5 | 4.83 M | 0 L | 54.8 M | 28.04 H | 349.2 H |
| S72 | 8.2 | 4.53 M | 0.38 L | 32.25 L | 27.24 H | 388 H |
| S73 | 7.7 | 22.37 VH | 0 L | 54.31 M | 22.2 H | 368.6 H |
| S74 | 7.8 | 6.57 M | 0 L | 55.69 M | 29.38 H | 300.7 H |
| S75 | 7.6 | 2.73 L | 0 L | 55.23 M | 23.42 H | 388 H |
| S76 | 7.7 | 8.33 H | 0.57 L | 53.57 M | 18.86 H | 329.8 H |
| S77 | 7.9 | 2.52 L | 0 L | 33.82 L | 18.62 H | 349.2 H |
| S78 | 8.1 | 1.72 L | 0 L | 33.09 L | 26.78 H | 271.6 H |
| S79 | 7.7 | 14.58 H | 0 L | 61.11 M | 21.66 H | 368.6 H |
| S80 | 7.7 | 1.26 L | 0 L | 60.72 M | 25.9 H | 349.2 H |
| S81 | 7.7 | 4.89 M | 0 L | 61.62 M | 25.88 H | 310.4 H |
| S82 | 7.8 | 7.05 M | 0 L | 60.31 M | 27.28 H | 388 H |
| S83 | 7.9 | 3.35 L | 0 L | 62.44 M | 19.28 H | 368.6 H |
| S84 | 7.9 | 9.23 H | 0 L | 62.03 M | 30.72 H | 358.9 H |
| S85 | 7.8 | 39.29 VH | 0 L | 59.97 M | 32.08 H | 388 H |
| S86 | 7.7 | 12.5 H | 0 L | 53.1 M | 14.32 M | 291 H |
| S87 | 7.7 | 3.65 L | 0 L | 53.96 M | 18.68 H | 329.8 H |
| S88 | 7.5 | 4.36 M | 0 L | 38.69 L | 24.32 H | 310.4 H |
| S89 | 8.2 | 2.14 L | 0 L | 38.07 L | 21.2 H | 300.7 H |
| min | 7.3 | 1.26 | 0 | 32.25 | 11.44 | 261.9 |
| max | 8.5 | 39.29 | 0.5715 | 72.29 | 34.12 | 388 |
| mean | 7.8 | 7.44 | 0.037 | 57.89 | 24.06 | 331.05 |
| | | low | Medium | high | Very High | |
| Available N | | 16.13% | 83.9% | 0% | | |
| Available P | | 0 | 6.45% | 93.55% | | |
| Available K | | 0 | 0 | 100% | | |
| O.M | | 100% | 0 | 0 | | |
| ECe | | 41.94% | 32.26% | 12.9% | | 12.9% |

Table 6. Soil fertility parameters of Baris-El -Kharga Oasis

| S.NO | pH | ECe dSm ⁻¹ | % O.M. | available macro nutrients | | |
|--------------------|------|--------------------------|---------------|---------------------------|------------------|---------|
| | | | | Nppm | Pppm | Kppm |
| S90 | 7.45 | 2.21 L | 0 L | 63.74 M | 25.56 H | 291 H |
| S91 | 7.8 | 1.21 L | 0 L | 62.95 M | 29.18 H | 281.3 H |
| S92 | 7.95 | 1.40 L | 0 L | 65.68 M | 25.3 H | 310.4 H |
| S93 | 7.6 | 1.89 L | 0.38 L | 64.93 M | 21.64 H | 349.2 H |
| S94 | 7.7 | 2.57 L | 0 L | 64.12 M | 24.78 H | 388 H |
| S95 | 7.6 | 5.22 M | 0.19 L | 63.35 M | 25.7 H | 300.7 H |
| S96 | 8.6 | 1.99 L | 0.19 L | 65.29 M | 25.08 H | 349.2 H |
| S97 | 7.7 | 4.36 M | 0.38 L | 64.52 M | 25.7 H | 407.4 H |
| S98 | 8 | 2.47 L | 0 L | 35.51 L | 3.48 L | 339.5 H |
| S99 | 7.7 | 14.62 M | 0 L | 59.56 M | 13.34 M | 349.2 H |
| S100 | 8.3 | 2.96 L | 0.76 L | 34.9 L | 17.5 H | 388 H |
| min | 7.45 | 1.21 | 0 | 34.9 | 3.48 | 281.3 |
| max | 8.6 | 14.61 | 0.76 | 65.68 | 29.18 | 407.4 |
| mean | 7.86 | 3.72 | 0.17 | 58.6 | 21.57 | 341.26 |
| sample | | LOW | MEDIUM | HIGH | Very High | |
| Available N | | 18.18% | 81.82% | 0% | | |
| Available P | | 9.1% | 9.1% | 81.8% | | |
| Available K | | 0% | 0% | 100% | | |
| O.M | | 100% | 0% | 0% | | |
| ECe | | 72.7% | 27.3% | 0% | | |

*L=low M=medium H=high VH= very high

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حالة خصوبة التربة في بعض المناطق الزراعية في واحة الخارجة بالوادي الجديد، مصر

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الملخص

تعتبر صلاحية العناصر الكبرى في التربة جانبا هاما في خصوبة التربة و الإنتاج الزراعي. أجريت هذه الدراسة لتحديد مستويات صلاحية بعض العناصر الكبرى وخصوبة التربة في تربة واحة الخارجة بالوادي الجديد. ولتحقيق هذا الهدف تم جمع عينات سطحية (٠-٣٠ سم) من واحة الخارجة وباريس، الوادي الجديد، مصر. تم إخضاع عينات التربة المجمعة للتحاليل الكيميائية. وأظهرت النتائج التي تم الحصول عليها أن مشكلة الأملاح والملوحة عموما والمادة العضوية المنخفضة هما المشكلتان المهيمنتان، في حين أن النيتروجين المتاح منخفض إلى متوسط، ولكن الفوسفور والبوتاسيوم في مستويات مرتفعة، وأظهرت البيانات الموجزة أن ٣٥٪ من العينات منخفضة النيتروجين المتاح بينما ٦٥٪ متوسطه المحتوى من النيتروجين المتاح وكان ذلك مرتبطا بالمواد العضوية المنخفضة (١٠٠٪ من العينات لديها أقل من ١٪). ومع ذلك، فإن ٩١٪ من العينات لها نسبة عالية من P (>15mg/kg) و ٥٪ و ٤٪ من العينات تم تصنيفها على أنها منخفضة ومتوسطة المحتوى من الفوسفور الميسر كانت ٩٨٪ من العينات مرتفعة في البوتاسيوم المتاح وكانت ٢٪ فقط متوسطة. ارتفاع الفوسفور والبوتاسيوم قد تكون ناتجة عن مائه الاصل في واحة الخارجة. طبقا للتوصيل الكهربائي لمستخلص عجيه التربه المشبعه ، ٤٩٪ من العينات لديها ECe أقل من 4ds/m، ٥١٪ من العينات كانت أعلى من 4ds/m، (٢١٪ المتوسطة، ١٦٪ عالية و ١٤٪ عالية جدا).

الكلمات الدالة: واحة الخارجة، الوادي الجديد، خصوبة التربة، نيتروجين فوسفور بوتاسيوم .