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C4-S2 C3-S1

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(Hussain, 1982)

Rhoades, et al. (1992) .

Ayers and Westcot (1989)

Richards (1954) .

Rhoades, et al. (1992) .

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(Hofuf Agricultural

Research Centre, HARC, 1973; Jenkins, 1976; Elprince, 1982; Al-Barrak
and Al-Badawi, 1988; Ministry of Agriculture and Water, 1985 and 1995)

الأدوات والطريقة:

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“ L”

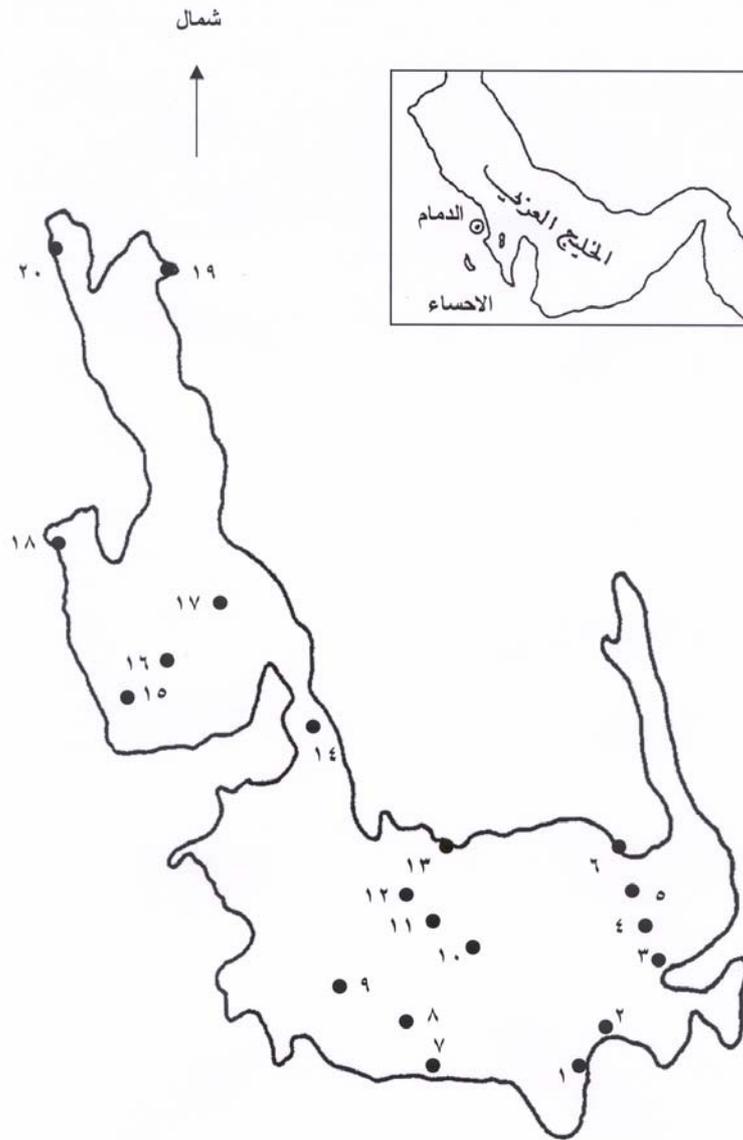
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.(Neogene aquifer)

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(EC)

(K) (Na) : (pH)
(Mg) (Ca) (Flame Photometer)
(CO₃) : (EDTA)
(Cl) (HCl) (HCO₃)
(SO₄) .(AgNO₃)

Methods of Soil Analysis

(Sodium Adsorption Ratio-SAR) .(Page, 1982)
Richards
(1954)

النتائج :

pH (dS m⁻¹) EC ()

(meq l⁻¹)

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()

dS m⁻¹ , ,

.(HARC, 1974; 1975; 1976 and 1979)

(, ± dS m⁻¹ ,)

.(, ± dS m⁻¹ ,) (, ± dS m⁻¹ ,)

() Tayeb (1983)

BRGM, 1977; HARC, 1979)

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pH

(, - ,)

.(, , ,)

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%

% % %

%

(HARC, 1973;

.Asseed, et al., 1983; Etewy, et al., 1983)

pH EC ()

أنيونات (meq l ⁻¹)				كاتيونات (meq l ⁻¹)				pH	EC (dS m ⁻¹)	الرقم الجغرافي	القطاع
SO ₄	Cl	HCO ₃	CO ₃	Mg	Ca	K	Na				
٢٣,٩٠	١٤,٥٠	٤,٢٠	٠	١١,١٠	١٤,٦٠	٠,٤٠	١٦,٥٠	٧,٣٠	٢,٣٨	١	الشرقي
٢,٦٠	٢٤,٠٠	٤,٧٠	٠	٩,٨٠	١١,٥٠	٠,٤٠	٩,٦٠	٧,٠٨	٢,١٦	٢	
٠	٢٢,٧٠	٤,٢٠	٠	٧,٥٠	٦,٢٠	٠,٥٠	١٢,٨٠	٧,٨٠	٢,١٠	٣	
٣,٦٠	١٨,٥٠	٤,٣٠	٠	٧,٩٠	٦,٣٠	٠,٥٠	١١,٧٠	٧,٥٤	٢,٠٢	٤	
٥,٠٠	٢٠,٥٠	٣,٧٠	٠	٩,٤٠	٧,٦٠	٠,٥٠	١١,٧٠	٧,٦٠	٢,٠٥	٥	
٩,٧٠	١٨,٠٠	٣,٤٠	٠	١١,٤٠	٨,٠٠	٠,٥٠	١١,٢٠	٧,٥٥	٢,٠٤	٦	
٧,٤٧	١٩,٧٠	٤,٠٨	٠	٩,٥٢	٩,٠٣	٠,٤٧	١٢,٢٥	٧,٤٨	٢,١٣	متوسط	
٥,٥٠	١٨,٠٠	٤,٠٠	٠	١٠,٤٠	٥,٥٠	٠,٤٣	١١,٢٠	٧,٧١	١,٩٧	٧	الأوسط
٠	٢٤,٦٠	٤,٣٠	٠	٨,٩٠	٦,٢٠	٠,٥٠	١٣,٣٠	٧,٦٩	١,٤٨	٨	
٣,٥٦	١٨,٠٠	٣,٥٠	٠	٦,٣٠	٧,١٠	٠,٥٠	١١,٢٠	٧,٨٨	١,٩٦	٩	
٥,٠٠	٢١,٠٠	٣,٩٠	٠	٩,٤٠	٦,٧٠	٠,٥٠	١٣,٣٠	٧,٩٥	٢,١٨	١٠	
١,٤٠	٢٠,٠٠	٤,١٠	٠	٨,٧٠	٦,٢٠	٠,٥٠	١٠,٠٩	٧,٥٥	١,٩٦	١١	
٣,٣٠	٢٠,٠٠	٣,٨٠	٠	١٠,٢٠	٦,٩٠	٠,٥٠	٩,٦٠	٧,٩٥	١,٩١	١٢	
٤,٤٠	١٧,٠٠	٣,٨٠	٠	٩,٤٠	٥,٢٠	٠,٥٠	١٠,٠٩	٧,٩٧	١,٩٠	١٣	
٣,٣١	١٩,٨٠	٣,٩١	٠	٩,٠٤	٦,٢٦	٠,٤٩	١١,٢٥	٧,٨١	١,٩١	متوسط	
١,٦٠	٢٦,٠٠	٣,٥٠	٠	٧,٦٠	٧,٣٠	٠,٧٠	١٥,٤٠	٧,٨٥	٢,٦٧	١٤	الشمالي
٠,٩٠	٢٦,٠٠	٤,٢٠	٠	٦,٢٠	٨,٢٠	٠,٧٠	١٦,٠٠	٨,١٨	٢,٦٠	١٥	
٣,٥٠	٢٣,٥٠	٣,٥٠	٠	٦,٢٠	٧,٦٠	٠,٧٠	١٦,٠٠	٧,٧٧	٢,٦٢	١٦	
٤,٤٠	٢١,٥٠	٤,١٠	٠	١٠,٣٠	٧,٣٠	٠,٦٠	١١,٧٠	٨,١٠	٢,١٧	١٧	
٠	٢٩,٤٠	٤,٧٠	٠	٧,٩٠	٨,٣٠	٠,٨٠	١٧,٠٠	٧,٥٥	٢,٧٥	١٨	
٧,٠٠	٢٠,٠٠	٤,٣٠	٠	١١,٦٠	٧,٤٠	٠,٥٠	١١,٧٠	٨,٠٣	٢,٢٥	١٩	
٣,٩٠	٢٤,٠٠	٤,٣٠	٠	٩,٢٠	٦,٣٠	٠,٧٠	١٦,٠٠	٧,٨٣	٢,٦٣	٢٠	
٣,٠٤	٢٤,٣٤	٤,٩٤	٠	٨,٤٣	٧,٤٩	٠,٦٧	١٤,٨٣	٧,٩٠	٢,٥٣	متوسط	

, , SAR ()

. (, ,)

(SAR)

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	-							
*	-	'	'	'	'	'	'	SAR
(, ±)								
*	'	'	'	'	'	'	'	SAR
(, ±)								
*	'	'	'	'	'	'	'	SAR
(, ±)								

* الأرقام بين الأقواس تعني قيم الانحراف المعياري (standard deviation).

المناقشة:

.(Allison, 1965; Wilcox and Durum, 1967)

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.(Allison, 1965)

(Richards, 1954)

() C4-S2 C3-S1

(S2 (S1) (C4) (C3)

()

	SAR	EC (dS m ⁻¹)		SAR	EC (dS m ⁻¹)		SAR	EC (dS m ⁻¹)
C4-S2	,	,	C3-S1	,	,	C3-S1	,	,

(-)

,)
()

(AL-Zeid, et al. 1988)

(Paliwal and Gandhi, 1973;

Hussain, 1981; Prichard, et al. 1983)

(Selassi and Wagenet, 1981; Shannon, et al., 1983; Al-Mukhtar and El-Hariri, 1984; Francois, et al., 1984; Ragab and Mohmed, 1984; Hummadi and Ghliem, 1987; Makki, et al., 1987; Basalah, 1991; Botella, et al.; 1993; Francois, 1994)

(Richards, 1954; Rhoades, 1974; Hoffman, 1983; Smedema and Rycroft, 1983)

(Bernstein, 1974; Maas and Hoffman, 1977; Maas, 1986)

Rhoades (1985)

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Hoffman, et al. (1984) .

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% %

(Alfalfa)

.(Dinar, et al., 1985)

التوصية :

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The Assessment of Irrigation Water Quality and its Agricultural Uses at Al-Hassa Oasis, KSA.

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Abstract:

Al-Hassa oasis is one of the largest agricultural areas in the Kingdom of Saudi Arabia. It covers an area of 16×10^3 ha of which 8×10^3 ha are under irrigated cultivation. The main source of irrigation water in the oasis is the underground water that feeds the hundreds of springs and wells distributed over the oasis. This paper aims to determine the quality of irrigation water and to evaluate its effects on soil properties and plants growth.

The main findings of this investigation showed that irrigation waters are high in salinity and low in sodicity as expressed in EC and SAR values, respectively. The water quality is classified as C3-S1 and C4-S2, according to the water quality classification of the USDA. This suggests that an adequate water management is needed when growing crops are irrigated with his water. Such management ought to prevent soil salinization and to optimize agricultural production as well as water utilization.
