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%

%

% / /

(Sample et al., 1980)

and Hoseinpour, 2007)

(Mengel and

/ /  
.Kirkby, 1987)

:

(Samadi, 2006)

)

(R-COOH)

(

(Marschner, 1995)

(Marschner,

.1995)

(Marschner, 1995)

(Strobel, 2001)

(Ma et al.,

.2009)

(Fox

(

)

:

and Comerford, 1990)

(Citrate)

(Biabanaki

(Malate)

(Oxalate)

m.rsadaghiani@urmia.ac.ir :

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(Fohse and Jungk, 1983)

)

(

(Banik and Dey,

( )

.1983; Neuman et al., 1999)

Ca<sup>+2</sup> Fe<sup>+3</sup> Al<sup>+3</sup>

Ca-P

Ca

pH (Gee and Bauder, 1986)

.(Jones and Darrah, 1994)

/ :

(2001) Lu et al.

(1934) Walkly and Black

(Rayment  
(CEC)

(CCE)

% / /

% / /

and Higginson, 1992)

(Page et al., 1982)

(Olsen et al., 1954)

Fe

CaCO<sub>3</sub> Ca

Al

(1970) Nagarajah et al.

pH

.(Hu et al., 2001)

pH

pH

pH

pH

Costate MSTATC

Excel

/

(KCl)

(KH<sub>2</sub>PO<sub>4</sub>)

( )

( )

( )

%

/

( / )

rpm

/

pH

( / )

(Murphy and Riley, 1962)

pH

CEC

OC

\*CCE

pH

mg kg<sup>-1</sup>

cmol<sub>c</sub> kg<sup>-1</sup>

%

%

vertic endoaquepts

S<sub>1</sub>

typic calcixerepts

S<sub>2</sub>

typic calcixerepts

S<sub>3</sub>

vertic calcixerepts

S<sub>4</sub>

typic calcixerepts

S<sub>5</sub>

OC

CCE

CEC\*

Archive of SID

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(2001) Lu et al. .

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≈ < < :

.(Nagarajah et al., 1970; Eral et al., 1979)

. < < < :

/ a	/ a	/ a	/ a	/ a*
/ b	/ c	/ c	/ b	/ a
/ b	/ c	/ b	/ c	/ b
/ a	/ b	/ c	/ c	/ a
/	/	/	/	/

LSD<sub>0.05</sub>

(2001) Hu et al.

( )

×

< <

(Hu et

al., 2001)

.(Lu et al., 2001)

/ ***	/ ***	/ ***
/ ***	/ ***	/ ***
/ ***	/ ***	/ ***
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×

(CV)

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×

( )

)

(

(mg kg<sup>-1</sup>)

						( )
/ A	/ f	/ a	/ b	/ b	/ b*	
/ B	/ fg	/ b	/ d	/ c	/ b	
/ C	/ g	/ d	/ d	/ e	/ d	
		/ D	/ A	/ C	/ C	/ B
			( )			( )

\*

(mg kg<sup>-1</sup>)

							( )
/ A	/ h	/ a	/ b	/ bc	/ h	/ a	
/ B	/ i	/ c	/ e	/ e	/ i	/ c	
/ C	/ i	/ d	/ g	/ f	/ i	/ d	
		/ D	/ A	/ C	/ B	/ A	
			( )			( )	

\*

(mg kg<sup>-1</sup>)

						( )
/ A	/ e	/ a	/ ab	/ b	/ b*	
/ B	/ ef	/ b	/ c	/ b	/ b	
/ C	/ f	/ cd	/ d	/ c	/ b	
		/ C	/ A	/ B	/ B	/ A
			( )			( )

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( ) ( ) ( )

Fixen )

( ) ( ) ( )

(and Grove, 1990

( )

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(

(White, 1981)

(Tisdale et al.,

( )

.1985)

(Hu et al., 2001)

(1979) Eral et al.

CCE

(2001) Hu et al.

CCE

Khademi et al.

(2009)

( )

(Haynes

.and Swift, 1989; Prafitt, 1978)

(Cambier and Sposito,

.1991; Vioante and Gianfreda, 1995)

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