

(1)

11 2004 ()
 4 () (7) (3)
 .(7.5.3.2.1.0) (20 15 10 5)
 . 5
 (%36.1) (%53.9) (%36.2)
 (%1.12) (%41.1) (%12.2)
 20 15 . 10
 (20 15) 3
 (%13.3) (%73.3)
 .(20) 5 (%36.7)
 . 7

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(1)

Influence of Water Requirement and Seed depth on the Germination of Seeds of Some Forage Crops

Ghufran Kattach⁽¹⁾

ABSTRACT

This study was carried out in a protected area at Rangeland and Dry Environment Research Station, belongs to ACSAD and Aleppo university in the Muslumieh, Aleppo, during 2004, by cultivating 11 plant species belong to three different families, *Fabaceae* (3 species), *Poaceae* (7 species) and *Rosaceae* (one species), using 4 moisture Levels (5, 10, 15 and 20 mm), and 6 seeding depths (0, 1, 2, 3, 5 and 7 cm). Results showed that the seeds of all the investigated species failed to germinate at the moisture level of 5 mm, while *Onobrychis sativa* (36.2%), *Agropyron elongatum* (53.9%), *Agropyron cristatum* (36.1%), *Phalaris tuberosa* (41.1%), *Dactylis glomerata* (12.2%) and *Sanguisorba minor* (1.12%) germinated under 10 mm humidity. The seeds of all investigated species germinated at the higher moisture levels (15 and 20 mm), but the germination ratio varied between the species. The seeds of all studied species were capable of germinating when placed at the soil surface and seeding depth of 3 cm. The seeds of *Agropyron elongatum* (73.3%), *Agropyron cristatum* (13.3%), *Phalaris tuberosa* (36.7%) were capable of germinating at depth of 5 cm. The seeds of all studied species failed to germinate at a the planting depth of 7 cm.

Key words: Planting depth, Soil moisture, Rangeland species, Seed germination, Water requirements.

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Imbibition
)

.%60-40

.(2008

Establishment

.(1994 Phillips Esler)

Evans)

.(1972 Young

.(1971 Dowling ;1968 Perry Miller)

.(1971 Hyder)

()

-1

-2

Solenostemma argel

Organigi (1982)

10 -5

15

5

(1969) Baker Hammouda

20 %16

10

%10

Haloxylon salicornicum

(1997)

5

Achillea fragrantissima

10

(2005)

Zheng

30

: -1

2004

(1)

()

37 13

36 20

20

)

. 425

.(

: -2

: 2004 ()

10

-1

25

25

. 7 5 3 2 1

%32

%29

8 pH . %11 %28
) (%0.5) .%35.5
 110 .(%0.002
 Gazanchian
 .(2006)
 3 628 3 471 3 314 3 157 -2
 20 15 10 5
 ° 20
 .(1968 Carelton) ° 14
 -3
 30

SPSS v. 11 (2001)

(P<0.001)

(1)

| | |
|------------------------------------|-----|
| | |
| Poaceae | |
| <i>Dactylis glomerata</i> L | -1 |
| <i>Agropyron elongatum</i> Host | -2 |
| <i>Agropyron cristatum</i> L | -3 |
| <i>Oryzopsis miliacea</i> L | -4 |
| <i>Phalaris tuberosa</i> L | -5 |
| <i>Eragrostis curvula</i> Schrad. | -6 |
| L <i>Panicum coloratum</i> | -7 |
| Rosaceae | |
| <i>Sanguisorba minor</i> Scop. | -8 |
| Fabaceae | |
| <i>Onobrychis sativa</i> Lam. | -9 |
| <i>Onobrychis aurantiaca</i> Boiss | -10 |
| <i>Medicago arboria</i> L | -11 |

(P<0.001)

()

(P<0.001)

(P<0.001)

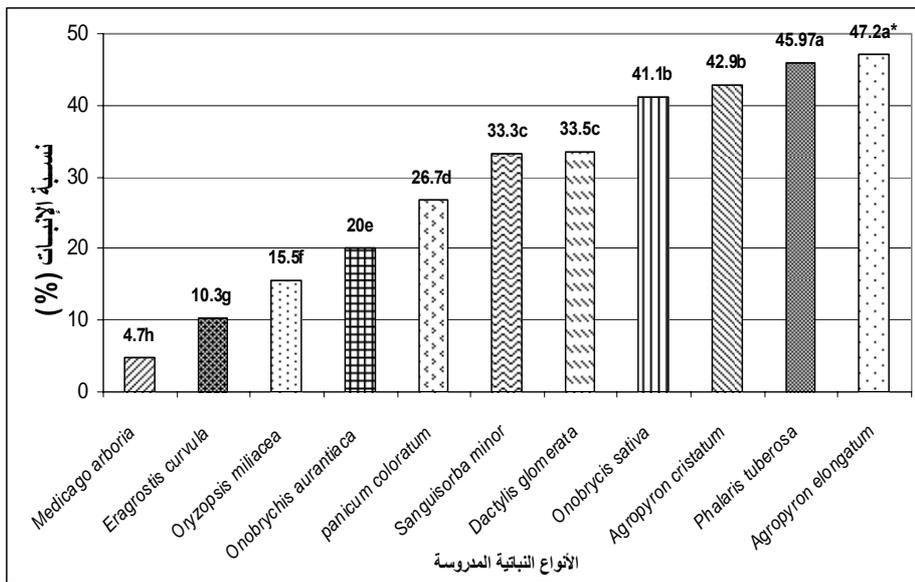
(P<0.001)

(P<0.001)

(%45.97)
%4.7

(%47.2)

(1)



*

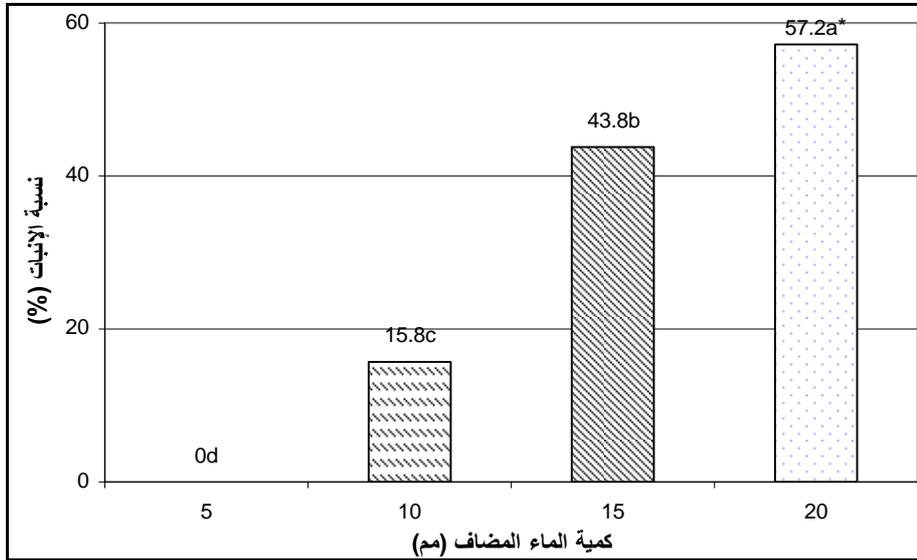
(%)

(1)

5

() (2) 10 15.8%
 57.2% 43.8%
 20 15

(P<0.001 r=0.539)
 7 5



(%) (2)

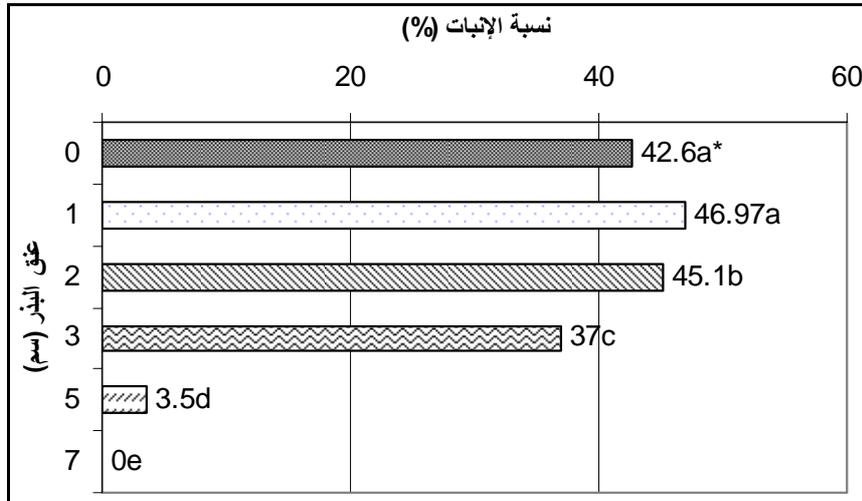
7 (P<0.001 r=-0.419)

(20)

)
 3.5% 5 .(
 ()
 2 1 .(3)
 (%45.1 %46.97)

3

()

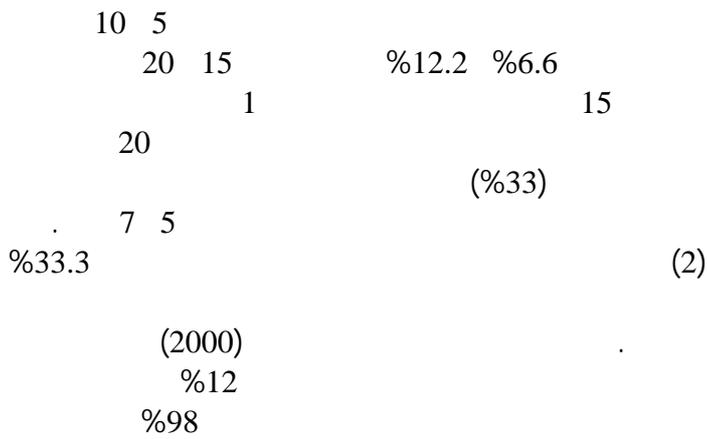


*

(%)

(3)

Medicago arboria



Onobrychis aurantiaca

10 5
 20 15 % 62.2 %17.8
 7 5 .(2)
 (%46.7) 1 15
 20

(%) (2)

| | | | | | | | | | | | | |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|---|---|
| | | | | | | | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 23.3 | 0 | 0 | 63.3 | 73.3 | 93.3 | 60.6 | 0 | 0 | 0 | 0 |
| 6.7 | 0 | 26.7 | 0 | 0 | 70.0 | 56.7 | 86.7 | 76.7 | 0 | 0 | 0 | 1 |
| 0 | 0 | 23.3 | 0 | 0 | 83.3 | 53.3 | 56.7 | 70.0 | 0 | 0 | 0 | 2 |
| 0 | 0 | 0 | 0 | 0 | 30.3 | 33.3 | 53.3 | 10.0 | 0 | 0 | 0 | 3 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33.3 | 0 | 0 | 0 | 0 | 5 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| 1.12 | 0 | 12.2 | 0 | 0 | 41.1 | 36.1 | 53.9 | 36.2 | 0 | 0 | | |
| 100 | 16.7 | 96.7 | 3.3 | 36.7 | 100 | 100 | 100 | 96.7 | 23.3 | 3.3 | 0 | |
| 100 | 86.7 | 86.8 | 13.3 | 46.7 | 100 | 100 | 100 | 96.7 | 46.7 | 16.7 | 1 | |
| 100 | 70.0 | 96.7 | 16.7 | 20.0 | 100 | 100 | 96.7 | 100 | 30.3 | 13.3 | 2 | |
| 100 | 73.3 | 60.0 | 0 | 3.3 | 100 | 100 | 96.7 | 100 | 6.7 | 6.6 | 3 | |
| 0 | 0 | 0 | 0 | 0 | 20 | 0 | 10.0 | 0 | 0 | 0 | 5 | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | |
| 66.7 | 41.1 | 56.7 | 5.5 | 17.8 | 70 | 66.7 | 67.2 | 65.6 | 17.8 | 6.6 | | |
| 93.3 | 96.7 | 93.3 | 20.0 | 73.3 | 100 | 100 | 86.7 | 96.7 | 90.0 | 33.3 | 0 | |
| 100 | 100 | 100 | 66.7 | 73.3 | 100 | 100 | 96.7 | 93.3 | 96.7 | 23.3 | 1 | |
| 100 | 100 | 100 | 83.3 | 70.0 | 100 | 100 | 96.7 | 96.7 | 93.3 | 10.0 | 2 | |
| 100 | 96.7 | 96.7 | 43.3 | 50.0 | 100 | 100 | 90.0 | 90.0 | 93.3 | 6.7 | 3 | |
| 0 | 0 | 0 | 0 | 0 | 36.7 | 13.3 | 73.3 | 0 | 0 | 0 | 5 | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | |
| 65.5 | 65.6 | 65.0 | 35.5 | 44.4 | 72.8 | 68.9 | 73.9 | 62.8 | 62.2 | 12.2 | | |

Onobrychis sativa

20 15 10
 .(2) 7 5
 %62.8 %65.6 %36.2
 15 %36.2 10
 . 3 2 1 20

Agropyron elongatum

20 15 10
 .(2)
 . 7 5
 %53.9 10
 (%93.3)
 %67.2 15 .
 -%100) 3
 .(%10) 5 (%96.7
 %73.9 20
 %73.3 (%96.7) 2 1
 . 5

Agropyron cristatum

15 10
 .(2) %68.9 %66.7 %36.1 20
 3 10
 -0) . 7 5
 (%100) 20 15 (3
 .(20) 5 %13.3

(2008) Eagle Koturbash

. 6 %2.8 4 %25.4

Phalaris tuberosa

15 %70 %41.1 10

.(2) %72.8 20

3

(%100) 20 15

%36.7 20 5

7 . 20 15

Oryzopsis miliacea

10

%17.8 15

. 20 %44.4

20 15 3

.(2) 7 5

(%46.7) 1 15

%50 20

(%70-73.3) 2

. 3

Eragrostis curvula

%5.5 15 .(2)

2

%35.5

2 . 20

.(%83.3 16.7) 20 15

Dactylis glomerata

15 10 %65 %56.7 %12.2

10 .(2) 20

2 1
 15
 7 5
 (%100) 2 1
 (%96.3) 3

. 7 5 3
 (%60) 3
 (%96.7 86.8 96.7) 2 1
 20
 .

%93.3

. 7 5

Panicum coloratum

15
 15
 20
 . 3
 .

%41.1
 . 20
 (%86.7) 1

.(2) %16.7

7 5

Sanguisorba minor

%66.7
 .(2) (%65.5) 20
 1
 3
 20
 .

10
 %1.12
 10
 %6.7
 15
 15
 7 5

| | | | | | |
|----|---------|---------|----------|------------|----|
| | (%53.9) | | (%36.2) | | -1 |
| | | (%41.1) | | (%36.1) | |
| | | 3 314 | | (%12.2) | |
| | | | | . 10 | |
| |) | 3 157 | | | -2 |
| | | | | .(5 | |
| | | | | | -3 |
| 15 | | | | | |
| | | | .(3 628) | 20 (3 471) | |
| | | | | | -4 |
| | | | .(20) | 5 | |
| | . 10 | | | | -5 |
| | | | | | -6 |
| | | . 7 | | | -7 |
| | | | | | |

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