
(Quercus castaneifolia C. A. Meyer)

()

()

// : // :

E-mail: aaaliarab@yahoo.com

(

)

.(World Bank, 2000)

(

(

)

/

/

/

)

/

(

)

(

(

.(Q= /)

/

/

/ /

Zelkova) (*Quercus castaneifolia*)

()

(*Carpinus betulus*) (*carpinifolia*)

Acer) (*Acer cappadocicum*)

(*velutinum*)

.()

()

(

()

/

)

(

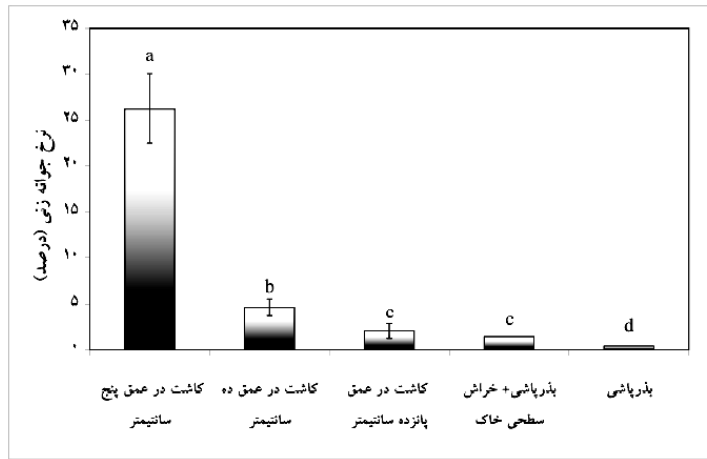
...

$(p= / \text{ d.f.}= F= /)$

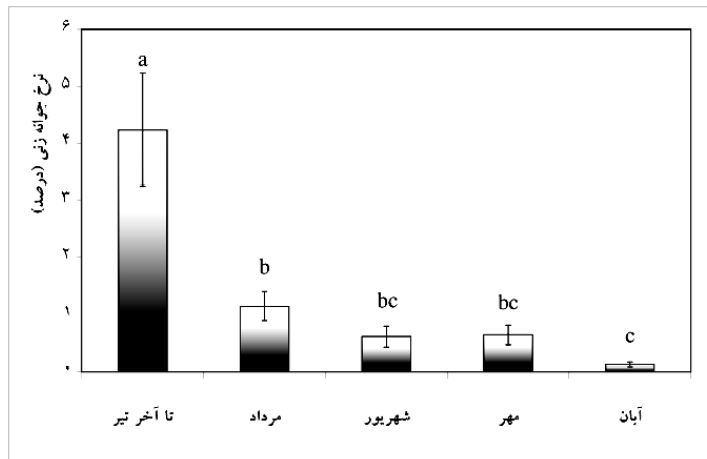
$(/)$

$()$

$()$

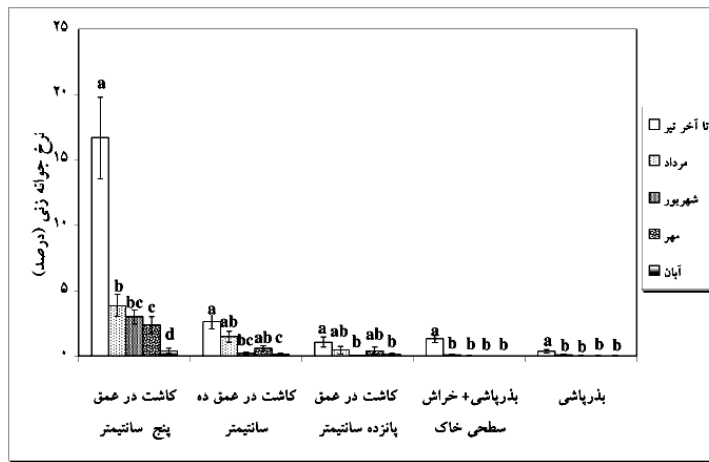


(\pm)



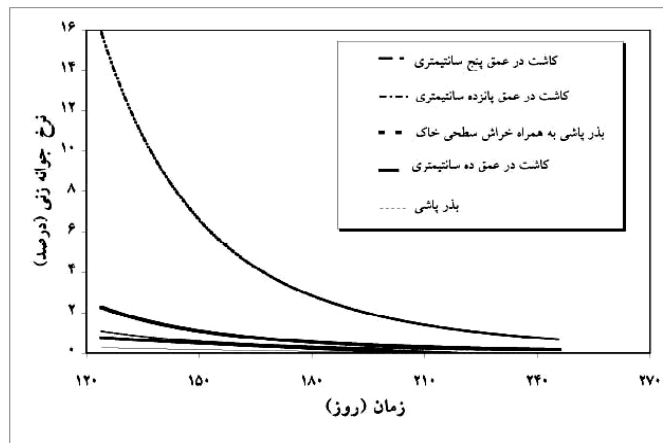
(\pm)

()



(±)

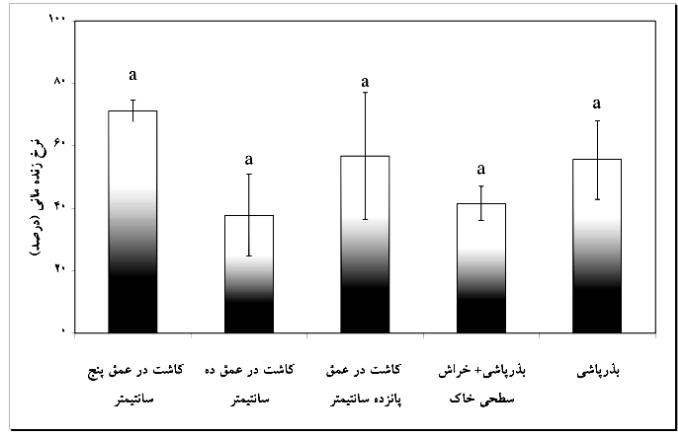
()



c	b	a	p	F	R ²		
/	/	/	/	/ **	/		
/	/	/	/	/ **	/		+
/	/	/	/	/ **	/		cm
/	/	/	/	/ **	/		cm
/	/	/	/	/ **	/		cm

** $y = a + bx + cx^2$ $y = a + \frac{b}{x}$ ♣

(p= / d.f.= F= /)



(Paterson and Mason, 1999)

Pinus) Bergsten Winsa () Allen

Betula) Karlsson (, *sylvestris*) Lof (, *Betula pubescens pendula* (*Q. rubra*)) Karlsson Orlander (, *Q. rubur* Lhotka (, *Pinus sylvestris* Guo () Lalhal (, *Q. stellata* *Q. pagoda*) Zaczek Arkansas () *Q.* / *Q. nigra semecarpifolia*) (*Q. persica*) (*Q. infectoria*) /

() Lalhal Li . () Ma (*Quercus semecarpifolia*) *Q.*) (*liaotungnsis*)

() Fuchs (*Q. garryana*) Vancouver (*Q. rubra*) Smith Auchmoody *Q. griffithi* *Q. pagoda*) Barik , *Q. garryana*) Fuchs (*Q. Q. pagoda*) Zaczek Lhotka (, *Q. castaneifolia*) (, *stellata*

...

()

Quercus

) *liaotungnsis*

(

) (*Hystrix indica*)

)

(

(IRIMO)

<http://www.irimet.net>

Quercus castaneifolia C.)

(A. Mey.

(Quercus castaneifolia)

.SPSS 10.0

- 11- Allen, J.A.; Keeland, B. D.; Stanturf, A.; Clewell, A. F. and Kennedy, H. E. 2001. A guide to bottomland hardwood restoration, U. S. Department of Agriculture Forest Service, Southern Research Station, General technical reports SRS-40, 132 P.
- 12- Auchmoody, L. R.; Smith, H. C. 1994. Planting northern red oak acorn: Is size and planting depth important?. Research paper, Northern Forest Experiment Station of USDA Forest Service, NO: NE-693, 115 p.
- 13- Barik, S. K.; Tripathy, R. S.; Pandey, H. N. and Rao, P. 1996. Tree regeneration in a subtropical humid forest: Effect of cultural disturbance on seed production, dispersal, and germination, *Journal of Applied ecology*, 33: 6, 1551-1560 pp.
- 14- Dytham, C. 1999. Choosing and using statistics, A biologist's guide. BlackWell Publication, 218 p.
- 15- Fuchs, M. A.; Krannitz, P. G. and Harestad, A. S. 2000. Factors affecting emergence and first year survival of seedlings of garry oaks (*Quercus garryana*) in British Columbia, Canada, *Forest Ecology and Management*, Vol: 137, 209-219 pp.
- 16- Guo, Y.; Shelton, M. G. and Lockhart, B. R. 1999. Effects of the forest floor and acorn placement on establishment and early development of water oak seedling. Proceeding of tenth biennial southern silvicultural research conference (USDA Forest service) 127- 131 pp.
- 17- Karlsson, C. 1996. Initial seedling emergence of hairy birch and silver birch on abandoned field following different site preparation regime, *new forests*, 11: 2, 93- 123 p.
- 18- Karlsson, C. and Orlander. G. 2000, Soil scarification shortly before a rich seed fall improved

...

-
- seedling establishment in seed tree stand of *Pinus sylvestris*. Scandinavian Journal of forest research, 15, 256- 266 pp.
- 19- Lalhal, J. S.; Vaneet, J.; Ombir, S.; Jishtu, V.; Singh, O. 1996. Seed collection and nursery emergence in *Quercus semecarpifolia* (Smith). Indian Foresters, Vol: 122, NO: 1, 85-86 pp.
 - 20- Lhotka, J. M. and Zaczek, J. 2001, The use of soil scarification to enhance oak regeneration in a mixed oak bottomland forest of southern Illinois, proceeding of the eleventh biennial southern silvicultural research (USA), 392- 395 pp.
 - 21- Li, Q. and Ma, K. 2003. Factors affecting establishment of *Quercus liaotungensis* Koidz. under mature mixed oak overstory and in shrubland, Forest Ecology and Management, Vol: 176, 133-146 pp.
 - 22- Lof, M. 2000. Influence of patch scarification and insect herbivory and growth and survival in *Fagus sylvatica* L., *Picea abies* L. karst. Forest ecology and management, vol: 134, 111- 123 pp.
 - 23- Paterson, D. B., and Mason, W. L., 1999. Cultivation of soils for forestry, forestry commission Bulletin 119, 85 pp.
 - 24- Pelosi, M. K. and Sandifer, T. M., 2003. Elementary statistics: from discovery to decision, John Willey & Sons, INC. 793 p.
 - 25- Winsa, H. and Bergsten, U. 1994. Direct seeding of *Pinus sylvestris* using micro site preparation and invigorated seed lots of different quality: 2-year results, Canadian journal of forest research (Canada), 24: 1, 77-86 pp.
 - 26- World Bank, 2000, World resources 2000-2001: People and ecosystems, the fraying web of life. Washington D. C. World Resources Institute, 389 p.

Effect of Different Seed Planting Techniques on Emergence and Survival of Oak (*Quercus castaneifolia* C. A. Mey.) during the First Growing Season

A. R. Aliarab¹ S. G. Jalali² M. Tabari² M. Akbarinia² S. M. Hosseini²

Abstract:

Because of difficulties arising in oak (*Quercus castaneifolia*) regeneration, in hyrcanian forests, determination of the best acorn planting technique for this species is indispensable. In this research a study site of northern aspect, clay loamy soil and 250 m above sea level elevation was prepared in the southern part of Noor in Mazandaran Province. Four different acorn planting techniques (seeding, accompanied seeding with soil scarification and acorn sowing in 5, 10 and 15 cm depth) were performed in fenced silvicultural plots. Following the first growing season the results revealed that: though soil scarification improved acorn emergence, but the best treatment was sowing in 5 cm depth. Seedlings emergence under different planting techniques was continued till the end of growing season with an increasing trend but for the acorns positioned on the soil surface (seeding, and seeding accompanied with soil scarification treatments), this procedure came to an end in July. Average seedling survival rate differed from 42% in seeding scarification treatment to 71 % in 5 cm sowing depth treatment, but there was no significant difference observed between planting techniques. As a whole, based on this study, acorn sowing can be proposed in 5 cm depth for seed planting in the study area as well as in other similar districts.

Keywords: *Quercus castaneifolia*, Soil scarification, Seeding, Sowing depth, Emergence, Survival.

1- Ph.D. Student of Forestry, Faculty of Natural Resources, Tarbiat Modarres University, P. O. Box: 46414-356 Noor,
E-mail: aaaliarab@yahoo.com
2- Asst. Prof. of Forestry, Faculty of Natural Resources, Tarbiat Modarres University.