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spss

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Ghafarian (2008)

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.Heinimann (2004)

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Naghdi (2005)

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Sobhani & Ghasemzade (1989)

.Sobhani (1999)

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.Miyata (1980) Dykstra (1996)

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Ghafarian Jourgholami (2008)

.(2007)

Curro

.Verani and (2001)

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Wang (1997) .

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¹Farm tractor

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Pirbavaghar et al.

(2007)

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SPSS

$$N = \frac{t^2 * s^2}{E^2}$$

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t

N

s

t

E

$$s = \frac{p}{e^{(r+d).t}}$$

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(P)

² Stepwise Regression

¹ Continuous Time Study

$$\frac{1}{N} = 100, d = r - i \quad (S)$$

$$r \quad r^1 \quad i \quad d$$

$$t = \quad :N$$

$$:(SH)$$

$$:(PH)$$

$$U = (PH/SH) \times 100 \quad (U)$$

$$:(N)$$

$$A = \{(P - \quad (A)$$

$$S) \cdot (N+1)\} / 2N + S$$

)

(

$$\alpha = P - S \quad D = a \cdot \frac{r \cdot (1+r)^t}{(-1) + (1+r)^t} \quad (D)$$

$$:S \quad :P \quad r$$

$$t =$$

$$I = A \cdot r \quad (I)$$

$$T = (D + I) \cdot 10\% \quad (T)$$

$$TFC/PH = (D + I + T) / PH \quad (TFC/PH)$$

$$TFC/SH = (D + I + T) / SH \quad (TFC/SH)$$

$$:(OC) (\quad)$$

$$:(MR) (F=0.9)$$

$$MR = [(P - S) / (N \cdot PH)] \cdot F$$

$$:(FLC)$$

%

$$] / \quad :(t)$$

$$[(1+r)^*$$

$$] / \quad :(k)$$

$$[(1+r)^*$$

$$TOC = MR + FLC + t + k :$$

$$(LC)$$

$$MRH/PH = TFC + TOC \quad (MRH)$$

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$$Y = \dots + \dots D + \dots RS = \dots$$

$$(\dots) = Y$$

$$(\dots) = D$$

$$(\dots) = S$$

$$Y = \dots + \dots DS + \dots RD = \dots$$

:

$$(\dots) = Y$$

$$(\dots) = D$$

$$* = DS$$

ANOVA

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ANOVA

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$$= \frac{I(I)}{I} =$$

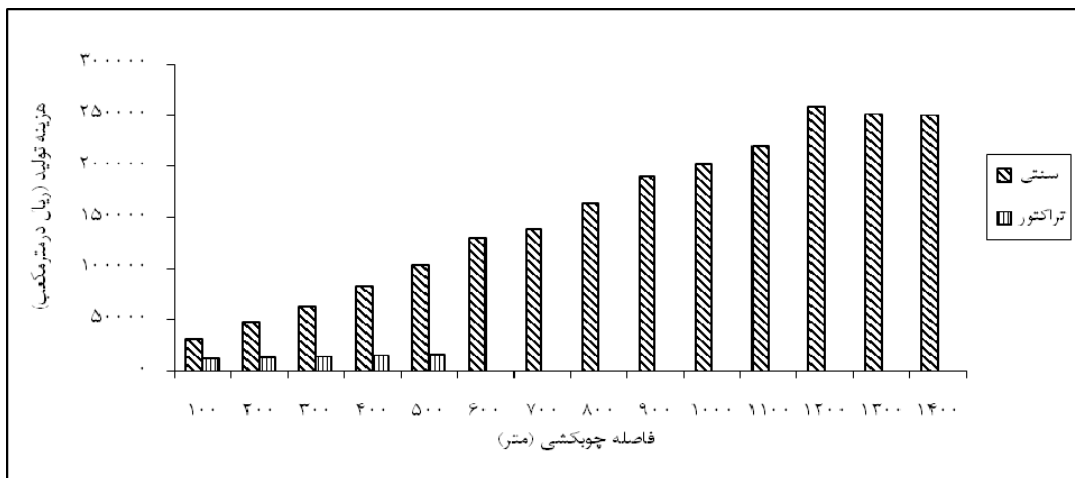
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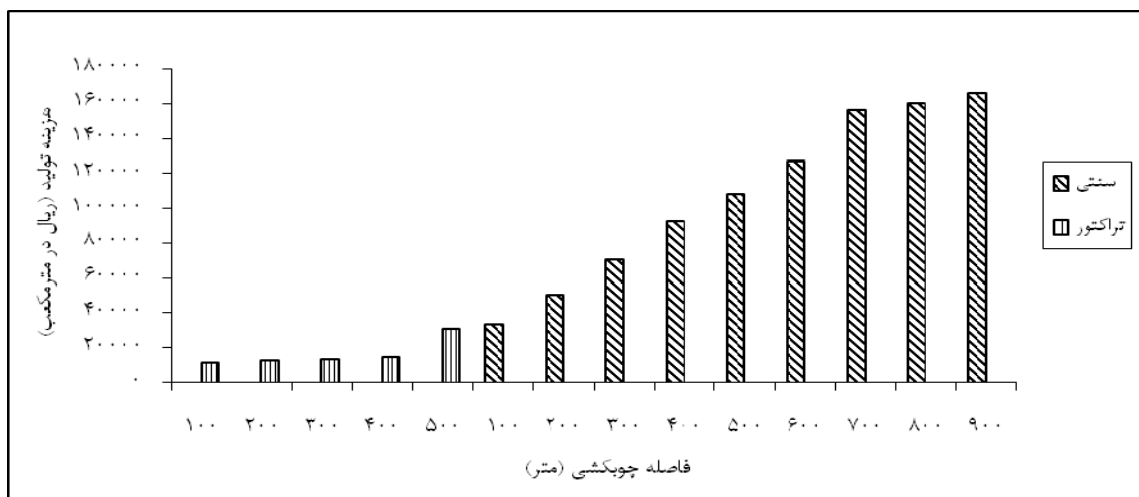
$$= \frac{I(I)}{I} =$$

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$$= \frac{I(I)}{I} =$$

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Jourgholami (2008) Ghafarian (2007)

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(2008)

Jourgholami Ghafarian

(2008)

Jourgholami (2008)

Jourgholami (2008) Ghafarian (2008)

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Optimum combination of animal and farm tractor skidding systems in wood harvesting

N. Gilanipoor¹, A. Najafi², S.M. Hesmatollvaezin³

¹ Forestry graduate student, Faculty of Natural Resources, Tarbiat Modarres University

² Forestry Department, Faculty of Natural Resources, Tarbiat Modarres University

³ Forestry Department, Faculty of Natural Resources of karaj, Tehran University

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Abstract

Having accurate information regarding to performance of skidding operations is essential to improve the economic status of a project for forest managers and contractors. The current study assessed the performance of farm tractor and mule logging systems to determine optimum combination of them. For this purpose continuous time study was used. The production model was developed using multiple regression model. Independent effective variables on farm tractor productivity were identified as skid trail slope and skidding distance and for animal system productivity the effect of skidding distance and interaction of distance and slope were significant. Productivity rate of farm tractor and animal skidding were 8.40 and 1.27 m³/hr, respectively. Costs of farm tractor and mule system were estimated 15,957 and 78,434 Rials per cubic meter, respectively. The results indicated that to reach best combination of two systems, timber must be transported as far as possible on skid trails by tractor, in this case total skidding cost will be reduced by 35%. Animal skidding system still must be limited in area where there is impossible to construct skid trail.

Key words: Skidding systems, Animal skidding, Farm tractor, Continuous time study, Multiple regression model, Hour cost, Hour productivity.