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*Scripoides holoschoenus* *Iris songarica*

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*Scripoides holoschoenus* *Iris songarica*  
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HEC-HMS

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(Gholami, 1994; Sadeghi, 1995; Tavakoli & Ghodousi, 2001)

(Mahdavi, 2009)

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(Mahdavi, 2009; Alizadeh, 2009)

(Habibzadeh, 2003)

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(Kousar, 1993)

(Ravi et al.,

2008)

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(Busby and (Wood and Blackburn, 1981)

Gifford, 1981)

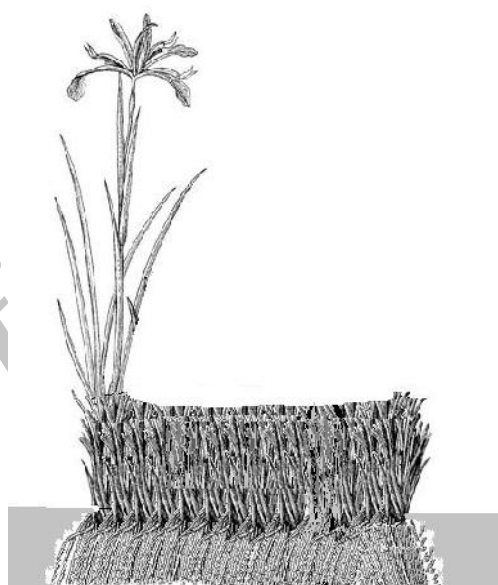
(Alidoust *et al.*, 2005) .

SWAT <sup>1</sup>WEPP

<sup>1</sup> Water Erosion Prediction System

<sup>2</sup> Soil and Water Assessment Tools

(Stahr *et al.*, 2004)



Archive of

*Scripoides* *Iris songarica*

*holoschoenus*

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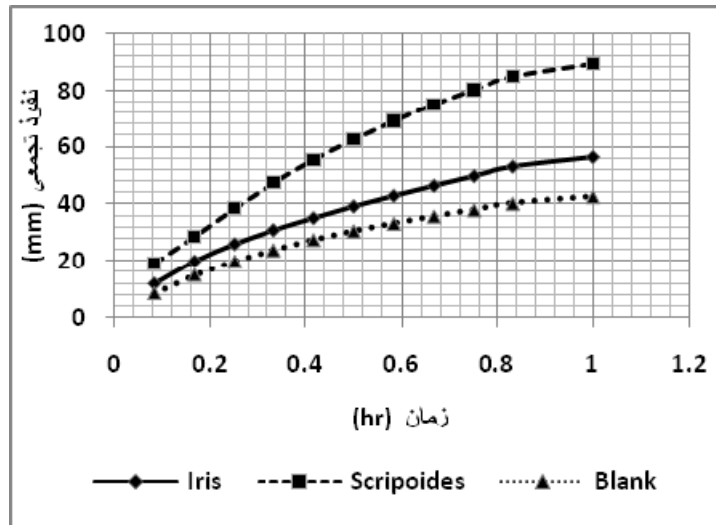
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L	/	/	/		/		
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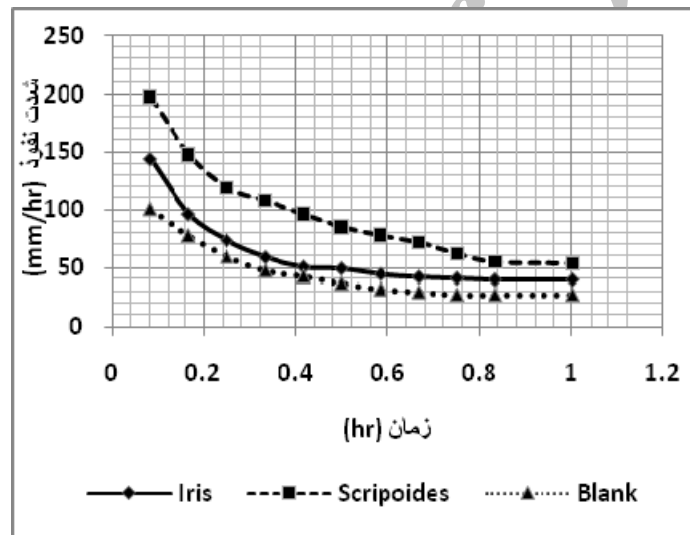
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 (R<sup>2</sup><sub>NS</sub>) ( )

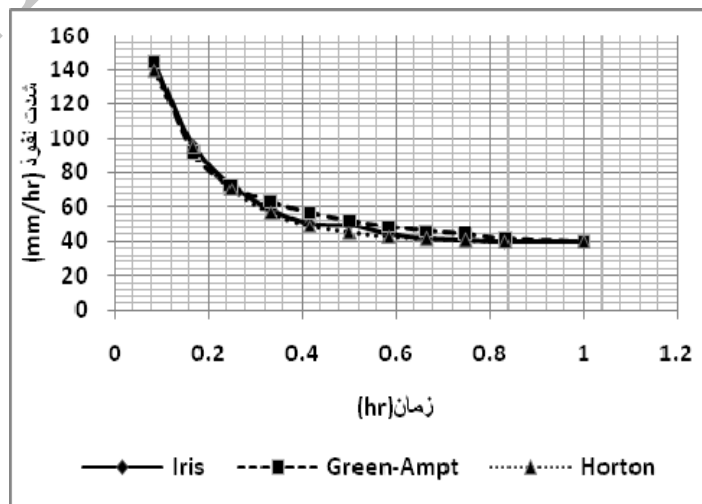
R <sup>2</sup> <sub>NS</sub>	هورتون			گرین - آمیت			تیمار	
	K	m	f <sub>c</sub> (mm/hr)	f <sub>0</sub> (mm/hr)	R <sup>2</sup> <sub>NS</sub>	K <sub>e</sub> (mm/hr)		B (mm <sup>2</sup> /hr)
۰/۵۵	۵/۷۶	-۰/۴۰	۲۷/۶۰	۱۰۰/۸۰	۰/۷۹	۱۲/۹۹	۷۳۷/۵۵	شاهد
۰/۸۴	۷/۰۷	-۰/۳۳	۳۹/۶۰	۲۱۹/۶۰	۰/۸۴	۹/۶۷	۷۶۵/۴۹	زنبق
۰/۷۱	۳/۱۷	-۰/۷۳	۵۴	۱۹۶/۸۰	۰/۸۱	۱۴/۷۴	۳۵۱۳/۷۵	اویارسلام

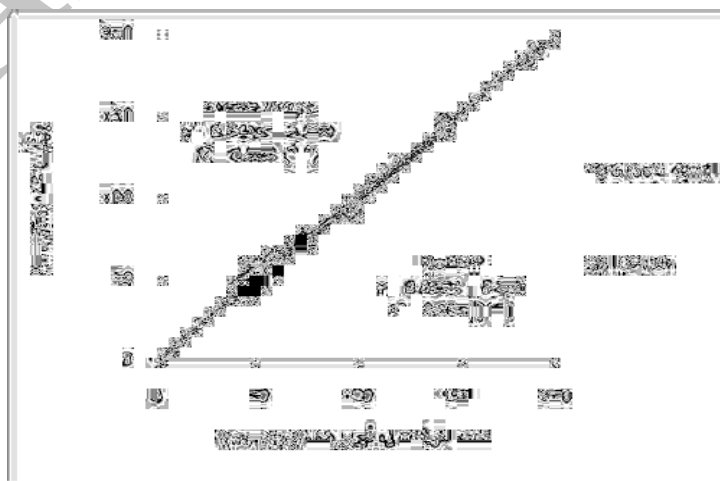
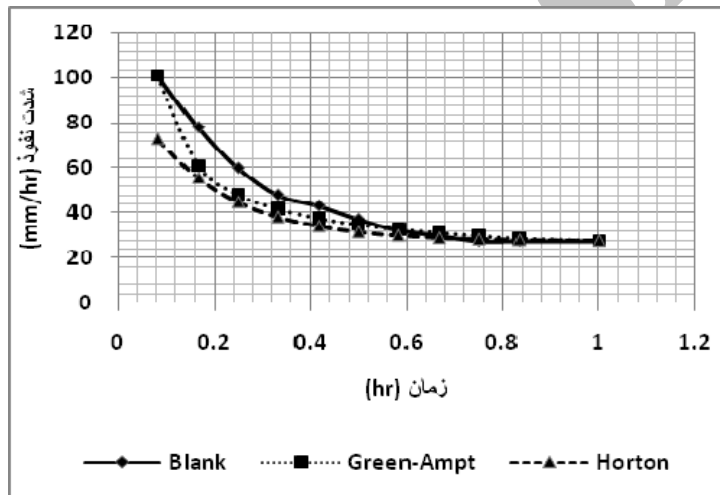
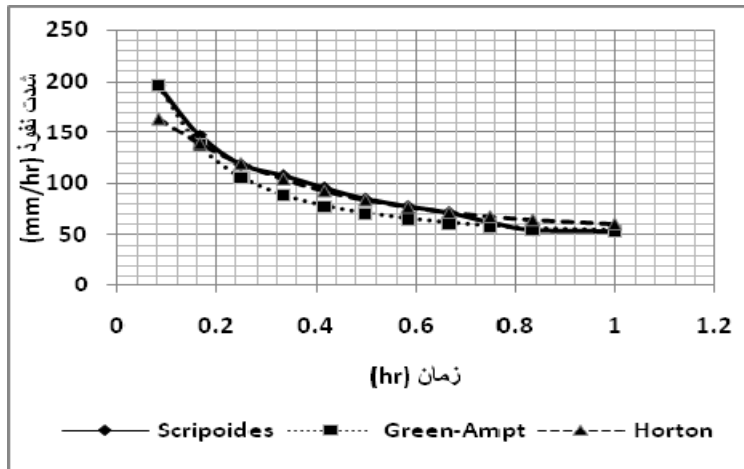


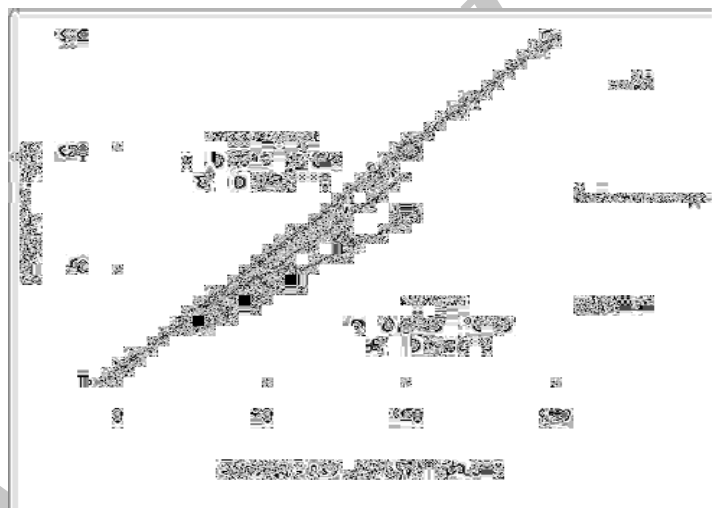
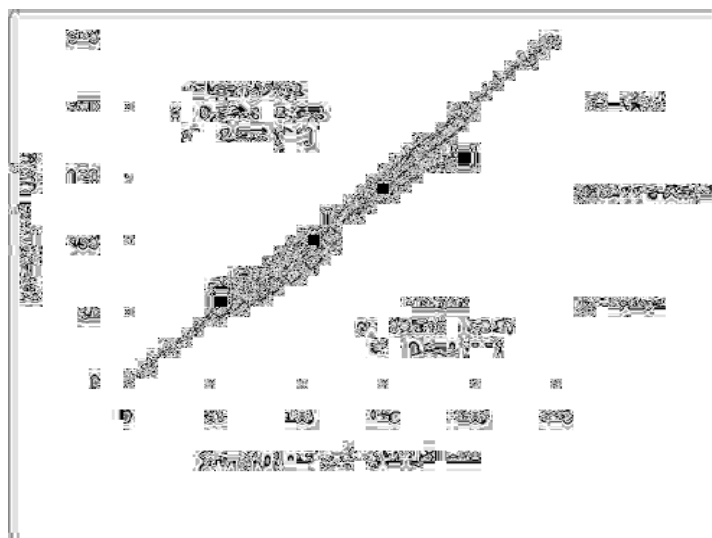
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(  $p < /$  )



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( ) *I. songarica*

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(Hosseini, 2001)



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(Vahabi, 1990)



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( ) *S. holoschoenus*

(Ravi *et al.*, 2008)

*Bouteloua gracilis*

*Scripoides*

*Iris songarica holoschoenus*

(Ravi *et al.*, 2008)

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(Stahr *et al.*, 2004)

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## Comparison of Infiltration Rate in Bare Soil and Ring-shaped Growth Pattern of *Iris songarica* and *Scripoides holoschoenus* species and Evaluation of Green-Ampt and Horton Infiltration Models

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(Received: 2011/July/05, Accepted: 2011/October/17)

### Abstract

Plant cover is one of the most important factors affecting infiltration rate of water into the soil and decreasing runoff. Distribution of plants in arid and semi-arid areas is almost patchy and form different patterns. One of the fascinating patterns is ring-shaped growth pattern. Ring patterns of varying size are formed by clonally reproducing grasses, sedges and even shrubs growing in resource-limited (water and nutrient) environments. Study on the role of ring pattern in infiltration rate is lacking. In this study infiltration rate was compared between ring patterns formed by *Iris songarica* and *Scripoides holoschoenus* and soil without plant cover (bare soil). Infiltration rate was measured by double ring in different time interval until infiltration was constant. Infiltration models efficiency were analyzed by calculation Nash-Sutcliffe coefficient. Result from paired T test analysis showed that infiltration rate was significantly different between two plants and also with bare soil ( $p < 0.01$ ). The results showed the cumulative infiltration rate for *Iris*, *Scripoides* and bare soil were  $56.5 \pm 2.8$ ,  $89.5 \pm 5.4$  and  $42.7 \pm 1.3$  mm, respectively. On the other hand, infiltration rate for *Iris*, *Scripoides* and bare soil were  $39.6 \pm 2.0$ ,  $54 \pm 2.7$  and  $27.6 \pm 1.4$  mm/hr, respectively. The root system and dead parts of plants in center of the rings were responsible for high infiltration rate in two plants. It is concluded that formation of ring is an adaptive characteristic of plant to use rainfall in one hand and in another hand it would increase groundwater level. Nash Sutcliffe ranges showed Green-Ampt and Horton models are in acceptable levels of performance for predicting infiltration rate of vegetal ring patterns and bare soil.

**Keywords:** Green-Ampt, Horton, Infiltration, Nash-Sutcliffe, Ring pattern