

## *Medicago*

*Trifolium pratens* *Sanguisorba minor* *Trifolium repens* *sativa*

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*Sanguisorba minor* *Trifolium repens* *Medicago sativa*

*Trifolium pratens*

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/ / *Medicago sativa* *Trifolium pratens*

*Trifolium* *Trifolium pratens* *Sanguisorba minor* *Medicago sativa*, :

*repens*

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*Atriplex*

*nummularia*

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*Atriplex nummularia*

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Stomatal transpiration

Cuticular Transpiration

Lenticular Transpiration

Gravimetric Method

Lysimeter

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Ecological Crisis

Transpiration

Leaf Area Index, LAI

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*Pinus ponderosa*

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*Tr. Tr. repens M. sativa*

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*Sa. minor pratens*

*Solanum melogenea*

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*M. sativa .*

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*Tr. repens*

*Bromus tecturum*

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*Tr. pratens .*

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*Phragmites australia*

*Sa. minor .*

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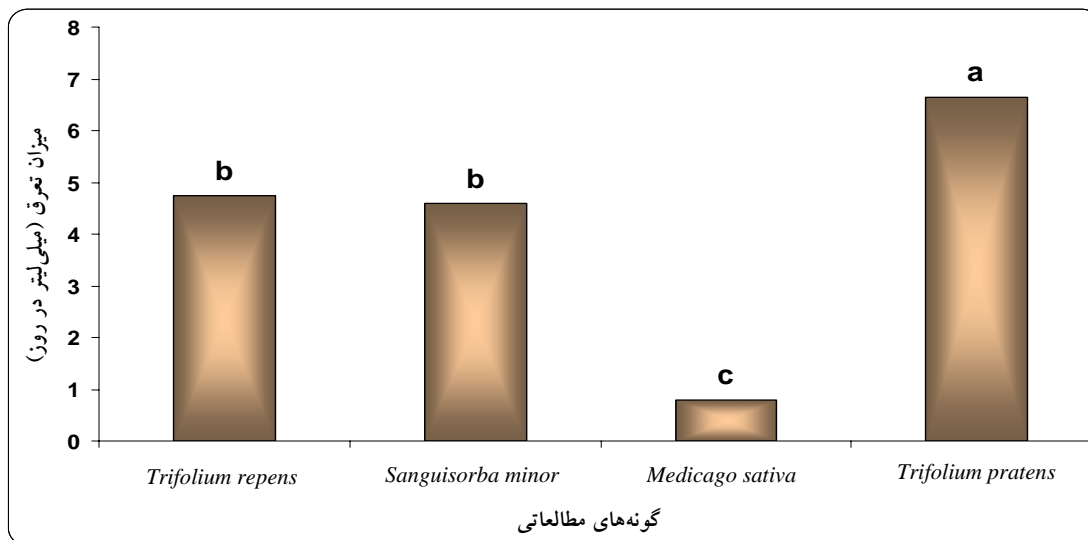
*Trifolium repens* *Medicago sativa*  
*Trifolium pratense* *Sanguisorba minor*

<i>Tr. pratens</i>	<i>Sa. minor</i>	<i>Tr. repens</i>	<i>M. sativa</i>	
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*M. sativa Tr. pratens*

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*Tr. pratens*

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| *M. sativa*

*M. sativa*

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*Tr.*

*M. sativa pratens*

*Tr. repens Sa. minor*

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*Tr. pratens*

*M. sativa*

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- 9- Calder, I.R., 1978. Transpiration observation from a spruce forest and comparison with predictions from an evaporation model, *Journal of Hydrology*, 38:33-47.
  - 10- Kaufmann, M.R., 1985. Annual transpiration in subalpine forests: Large differences among four tree species, *J. Forest Ecology and Management*, 13: 235-264.
  - 11- Kirnak, H., Kaya, C., Tas, I., and Higges, D., 2001. The influence of water deficit on vegetative growth, Physiology, fruit yield and quality in eggplants, *Journal of Plant Physiology*, 27(3-4): 34-46.
  - 12- Louise, K., Alon B.G., and Erik, J., 2005. Modelling transpiration and growth in salinity-stressed tomato under different climatic conditions, *J. Ecological Modelling*, 51: 69-82.
  - 13- Moro, M., Domingo F., and Lopez, G., 2004. Seasonal transpiration pattern of *Phragmites australis* in a wetland of semi-arid Spain, *Hydrological Processes*, 18: 213-227.
  - 14- Obrist, D., Verburg, P.S.J. Young, M.H., Coleman, J.S., Schorran, D.E. and Arnone, J.A., 2003. Quantifying the effect of phenology on ecosystem evapotranspiration in planted grassland mesocosms using Ecocell technology, *J. Agricultural and Forest Meteorology*, 118:173-183.
  - 15- Palmer, J.H., Trickett, E.S., and Linacre, E.T., 1964. Transpiration response of *Atriplex nummularia* Lindl and upland cotton vegetation to soil-moisture stress. *J. Agricultural Meteorology*, 1: 282-293.
  - 16- Roberts, J. and Rosier P.T.W., 1993. Physiological studies in young Eucalyptus stands in southern India and derived estimates of forest transpiration. *J. Agricultural Water Management*, 24: 103-118.
  - 17- Roberts, J., 2001. The influence of physical and physiological characteristics of vegetation on their hydrological response, *Hydrological Processes*, 14: 2885-2901.
  - 18- Ryan, M., Bond, B., Law, B., Hubbard, R., Woodruff, D., Cieniala, E. and Kucera, J., 2000. Transpiration and whole-tree conductance in ponderosa pine trees of different heights, *Oecologia*, 124: 553-560.

## Comparative study of transpiration and dry matter production in rangeland species of *Medicago sativa*, *Trifolium repens*, *Sanguisorba minor* and *Trifolium pratens*

S. Ebrahimi Azandaryani<sup>1</sup> and S. H. R. Sadeghi<sup>\*2</sup>

<sup>1</sup> Former M.Sc. Student, Department of Rangeland Management College of Natural Resources and Marine Sciences, Tarbiat Modares University, Noor, I.R.Iran

<sup>2</sup> Associate Professor, Department of Watershed Management Engineering, College of Natural Resources and Marine Sciences, Tarbiat Modares University, Noor, I.R.Iran

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### Abstract

Recognition of rangeland species with the maximum efficiency and the minimum water usage is very important, since major parts of rangelands in Iran are located in arid and semiarid climate. In addition, the rangeland improvement and management on the basis of transpiration rate of rangeland species in different climatic conditions has great importance. The goal of this research is comparison and measurement of transpiration rate in four important species of *Medicago sativa*, *Trifolium repens*, *Sanguisorba minor* and *Trifolium pratens* as well as the assessment of their efficiency in dry matter production under semi natural conditions in College of Natural Resources and Marine Sciences, Tarbiat Modares University, during spring and summer of 2005. The rates of daily transpiration of the mentioned species were measured in small vases with upper area of 50.27cm<sup>2</sup> in 5 replications and adjacent to five control vases during 85 days using weighting method. The results of the study showed that the maximum and minimum rate of transpiration per dry matter is related to *Trifolium pratens* and *Medicago sativa* with the values of 498.253 and 59.274 ml, respectively. The applications of such type of result facilitates the determination of water requirement of rangeland ecosystems under improving operations and also lead to select the most suitable improvement method and rangeland species as well.

**Key words:** Daily transpiration, Weighting method, *Medicago sativa*, *Trifolium repens*, *Sanguisorba minor*, *Trifolium pratens*.