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## Evaluation of heat tolerance of alfalfa varieties (*Medicago sativa*) at seedling stage

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**Key words** : evaluation ; heat tolerance ; alfalfa ; seedling stage

**Introduction** Alfalfa (*Medicago sativa*) is an important legume forage used widely in China. However, high temperature is still the main adverse factor limiting alfalfa production. The aim of the present study was to evaluate heat tolerance of 30 alfalfa varieties to choose high heat tolerance alfalfa applied in some high temperature areas in China.

**Materials and methods** 30 alfalfa varieties including Lobo, Algonquin, Golden empress, Affiniy, Hunter river, Siriver, Amerileaf 721, WL-525HQ, Pondus, Amerigraze, Powerplant, L-350, L-400, forerunner etc were chosen to evaluate their heat tolerance. All alfalfa varieties were grown in plastic pots (10 cm in diameter, 10 cm long). Each pot had eight plants and each variety replicated ten times. The plants were divided into two groups when the plants were 40 days. One group was control and the other group was treatment. Then the pots were transferred to two artificial climatic chambers with 14-h photoperiod, a photosynthetically active radiation of  $160 \mu\text{mol m}^{-2} \text{ s}^{-1}$  at the canopy level, a relative humidity of  $70 \pm 10\%$ , and one artificial climatic chamber's temperature was  $25^\circ\text{C}/20^\circ\text{C}$  (control) the other one's temperature was  $38^\circ\text{C}/33^\circ\text{C}$  (treatment). The heat injury index, recovery index, alfalfa biomass and biomass stress index were recorded after the plants were stress 10 days and resume 4 days.

**Results** The results of heat injury index, recovery index, subordinate function analysis and cluster analysis showed that L-400, Grandeur, Powerplant, Landmark 5mf, Affiniy expressed significant tolerance to high temperature. The results of alfalfa biomass showed that underground biomass, root/shoot ratio, underground biomass stress index, root/shoot ratio stress index were higher in strong heat-resistance alfalfa than those of weak heat-resistance alfalfa on the whole.

**Discussion** Heat injury index and recovery index can evaluate the heat tolerance of alfalfa at seedling stage effectively. Compared with single index, several indexes can evaluate heat tolerance of alfalfa comprehensively.

### References

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