



Study of Morphological Characteristics and Forage Quality of *Amaranthus hypochondriacus* L. under some Seed Priming

S. Maleki khezerlu^{1*} - M. Tajbakhsh²

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Introduction

Amaranthus (*Amaranthus hypochondriacus* L.) is a broad-leaved plant that was considered as new plant in many world countries such as Iran. Studies have showed that nutritional quality of amaranthus are higher than cereals and forage crops. Using treatments before planting will result in high germination rate, fast and appropriate establishment, and play important role on agronomic yield of crops. Study of seed organic pretreatment for morphological characteristics and quality according to forage desirable quality of amaranthus, as new plant in Iran, production deficit and forage qualitative reducing in this country on recent years, can be positive step to introduce this plant as forage security source.

Materials and Methods

To study the means of morphological characteristics and forage quality of amaranthus under seed pretreatment, a trial was arranged as randomized completely block design with six treatments and three replications in research field of agricultural college of Urmia university. Treatments were including seed priming of pigeon manure (10%), concentrated vaniase (68.39%) (three in thousand) super macro plus nano chelate fertilizer (three in thousand), magnet water, Homeopathy 12x and control. The seeds were soaked in the listed treatments for 8 hours, therefore those were brought to the initial moisture content for 24 hours at 25 °C and transferred to field for planting. Ground preparation was concluded in the beginning of June as furrow-ridge. Seed were placed in 1-2 cm soil depth. Evaluated traits in current study were including plant height, secondary bough number, stem diagonal and forage quality. Harvest was at flowering stage in one square meter of each experimental unit. Samples were dried and milled. Therefore, near-infrared spectroscopy (NIR) technology was used for forage quality measurement.

Results and Discussion

Results of analysis variance indicated that treatment effects on plant height and diagonal stem were not significant, but was significant for leaf number and secondary bough number. Using priming led to plant height and stem diagonal increasing, but were statistically not significant. The highest leaf number was related to magnetic water pretreatment (395 leaves in square meter), then pigeon manure (362.3 leaves in square meter). The highest secondary bough was related to magnet water pretreatment. After primed seed establishment in soil, the seeds were germinated more monotonous, faster and better than no-treatment. Actually, plants derived from primed seeds were developed root systems on the shortest time as compared with seeds without pretreatment because of desirable suction of nutrition material and water, and ecological and biological sections production. Treatment effect was significant for all traits except to ash percent. The most crude protein percent and soluble carbohydrate and digestibility dry matter was related to pretreatment of pigeon manure respectively 25.4%, 11.8% and 51.5%. The highest percentage of soluble fiber on neutral detergents and soluble fiber on acidic detergent, and crude fiber were obtained for control respectively by 59.7%, 43/03% and 26/6%. Crude protein value of forage was significantly related to digestibility percent that is one of the most important factors determining forage quality. Increasing crude fiber will result in reduction of protein and nutrition value of crops. *Amaranthus* was placed on desirable qualitative degree for crude protein percentage and digestibility according to grass species categories for indicators values of forage quality.

Conclusions

According to forage desirable quality of amaranthus, as new plant in Iran, production deficit and forage qualitative reducing in Iran, seed enrichment with desired elements led to better germination and growth, high production and quality of crop. According to obtained results in current study, using organic seed pretreatment

1- Ph.D. Student of Agronomy, Urmia University, Urmia, Iran

2- Professor of Agronomy, Urmia University, Urmia, Iran

(*- Corresponding Author Email: s.maleki_kh@yahoo.com)

led to qualitative and quantitative enhancement of amaranthus forage. Therefore, seeds treatment before planting using organic fertilizers produced in the field will lead to fertilizer preparation related the cost saving, and income value will be economically more than the cost and cost-effective for farmers.

Keywords: Amaranthus, Magnetic water, Pigeon manure, Primin