

LONG TERM PERFORMANCE OF AN ARTIFICIAL PASTURE VEGETATION UNDER MEDITERRANEAN CONDITIONS IN TURKEY

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Abstract

A study on artificial pasture was conducted in the experimental field of a private farm Aydin-Turkey which was under typical Mediterranean climatic conditions, during 2002-2009. Some promising legumes in this environment (Medicago sativa, Lotus corniculatus, Trifolium resupinatum) and some grasses (Bromus inermis, Dactylis glomerata, Festuca arundinacea, Arrhenatherum elatius) as well as Sangsangorha minor were sown as a mixture. Stand yield characteristics and crop performances of sward were tested for 7 yrs under cattle grazing. The results indicated the adverse effects of Mediterranean climate and to some extent grazing on yield and cover characteristics of some mixture crop material, particularly T.resupinatum, B.inermis and D.glomerata. On the contrary, F.arundinacea, M.sativa, A.elatius and L.corniculatus displayed higher contributions to total yield.

Introduction

The most crucial handicap of the Turkish animal husbandry sector is to provide cheap and high quality roughage to farms. Since the roughage costs are generally 70% of expenditure in animal production, there is an urgent need to improve grasslands. Remembering the Mediterranean conditions of Western Turkey which allows favourable crop growth, it must be emphasized that any attempt to benefit from alternatives of new forage crop introductions is of vital significance. Artificial pasture (rotation pasture) establishments under field conditions in the area may be one of those attempts to promote roughage production. It should be also emphasized that number of alternative warm or cool season grasses productive and persistent under Mediterranean climate are quite limited compared to humid continental climates. The objective of this study was to practice a promising artificial pasture mixture and to test new crop cultivars under a grazing regime for long-term use in the region.

Materials and Methods

The experiment was carried out for 7 years on a silty-sand loam soil with 7.1 pH in the area (35 m x 35 m) (LSD) test was performed.

Results and Discussion

There were significant differences among total dry matter yield of experimental years (Fig.2). Sward total DM yields increased until 2006 and decreased in the following years (2007-2009). DM yields data also confirmed that Ms and Fa performed far better than other crops in sward. Some species were found to be less productive as compared to others. General performances of the mixture were quite reasonable in sward whereas weeds invaded the gap left by disappointing individuals of Tr, Bi and Dg. The latter species are known as being susceptible to high atmospheric heat, low intensity and low soil moisture, which are the essential characteristics of Mediterranean environment. (Hall et al, 2009). Our results confirmed related information given by Lacefield et al (2001) and Deuk et al. (2002). Existing as an indigenous species in the region, Ms cultivar maintained a reasonable performance in sward whereas weeds invaded the gap left by disappointing individuals of Tr, Bi and Dg (Santagaud, 2002). The results of the long-term cover tests in the experiment supported the approach of a mixture of grasses to try to overcome the problems of all species. Warda and Krywiec (2003) reported that indigenous species have strong competitive crops and an acceptable rate of existence is unavoidable. Ae and Sm maintained reasonable percentages in botanical composition.

General cover rates in succeeding years decreased mainly because of weed infestation (Fig.3). In addition to Mediterranean climatic impacts, it is obvious that grazing has to some extent adverse effect on pasture crops, and thinning in the swards is expected. Although the increasing weed infestation and decreasing cover rates, better yield performances were generally recorded during the experimental years. General performance of Mediterranean environments (Hall et al, 2009). Our results confirmed related information given by Lacefield et al (2001) and Deuk et al. (2002). Existing as an indigenous species in the region, Ms cultivar maintained a reasonable performance in sward whereas weeds invaded the gap left by disappointing individuals of Tr, Bi and Dg (Santagaud, 2002). The results of the long-term cover tests in the experiment supported the approach of a mixture of grasses to try to overcome the problems of all species. Warda and Krywiec (2003) reported that indigenous species have strong competitive crops and an acceptable rate of existence is unavoidable. Ae and Sm maintained reasonable percentages in botanical composition.

Conclusion

We concluded that Ms and Fa were the permanent and most successful legume and grass crops in the mixture, with respect to botanical composition throughout the experimental years. With respect to DM yield and cover characteristics, same components of the mixture also performed well and have been evaluated as recommendable for all resembling Mediterranean environments. It was also suggested that Le and Ae, both exhibiting stable and sustainable DM yield and cover contribution to overall performances of the sward, should be included in this type of Mediterranean pasture mixture. General performances of Tr, Bi and Dg in the mixture proved that more attention should be paid to consider these forage crops in mixtures and indicated the necessity for further investigations.

References


