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PAGES: 0-0

ORIGINAL PDF URL: <https://dergipark.org.tr/tr/download/article-file/20042>

**GRASSLAND AND FORAGE CROP CULTIVATION IN
TURKISH AGRICULTURE**

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ABSTRACT: *The rapid increase in the population, the increasing nutrition requirements of the population and the development in the export of agricultural and agro-industrial products necessitate the production of agricultural products to be increased. In order to accomplish this, it is necessary to modernise agriculture in accordance with the contemporary technology.*

In this study it was aimed to point out and summarise the importance of grassland farming and animal husbandry as a mean of conserving environmental resources and at the same time efficiently producing forage crops that can be converted into valuable food for men. Forage crops and livestock development now require an increase in productivity and particularly integration.

Key words: *Grassland, rangeland, forage crop, grassland improvement.*

INTRODUCTION

In Turkey, especially in rural areas, a deficiency of animal protein is highly evident in human diet. The urgent need for increasing the production of higher value foods, such as meat and dairy products, is one of the concerns of Government in its present agricultural development plan. Moreover, in order to raise the level of living of the rural population and the import-export situation, an increase in animal production is necessary. Increasing agricultural output for both domestic consumption and export is particularly important for the economic breakthroughs development of developing countries (Avcioğlu et al., 1998).

Any increase in agricultural production would depend on the productivity to be accomplished in the area which are already under cultivation, since the cultivable area in Turkey is almost in limit. In this way the level of farmers may be increased and agriculture may be caused to contribute more to the national economy.

An increase in agricultural productivity can be possible by providing the farmers adequate agricultural research, extension and training services and sufficient amounts of agricultural inputs in time, and by finding sound and stable markets for the products (Anonymous, 1959).

The greatest potential for increased livestock production in Turkey lies in more effective and efficient utilisation of land already devoted to livestock production primarily by cattle and sheep. Because animal numbers are greatly in excess of the available feed supply, severe overgrazing has caused deterioration of the existing grazing land resource in many places (Munzur, 1989). Not only is animal performance reduced but grazing land deteriorated because of soil erosion and replacement of desirable species with unproductive vegetation. It is apparent that major attention must be given to both dimension of this problem. Therefore the situation calls for urgent measures.

The position in Turkey is less satisfactory due to the unfavourable climatic conditions, diverse land use and ownership pattern, inadequate policies and regulations, persistence of tradition, lack of integration of essential services and other problems. Social structure, inadequate operator understanding, lack of trained technicians, enforcement difficulties, and the absence of regulatory policies constitute a problem complex that discourages range management practices (Avcioğlu, 1978).

Animal husbandry is a process involving the interaction of a large number of variables, both economic and non-economic. Some variables are highly specific to localities where the animal production takes place.

Operational levels for implementation of specific components of successful livestock production programs include;

- feed resources (Karaca et al., 1998),
- adapted genetic stocks,
- housing,
- implementation of technology relating to all aspects of production and health protection,
- managerial capability,
- processing and marketing and

- credit availability.

The types and magnitude of livestock programs being recommended must be synchronised with projected increases in feed resources. The decisive factor in live stocks rearing is feed cost, using pastures in an excellent method of keeping costs down.

There is also a need to correct the regional imbalances in Turkish economic growth: Specifically, to take active measures to promote faster development in rural areas. Technical possibilities exist for raising farm incomes from intensified crop and livestock production and processing, and the increased cereal and livestock production would be readily absorbed by rising domestic demand. A significant impact on rural living standards in rural areas can, however, only be made if wide spectrums of activities are undertaken including farm development, improvement of infrastructure, development of agro-industry and strengthening of services (Soya et al., 1997).

Turkey's total land area of 78 million ha includes 20 million ha of forests, 22 million ha of pastures and rangelands and 28 million ha which are cultivated for the production of annual or perennial crops. Out of 28 million ha considered agricultural, 17.7 million ha are cultivated each year for field crops and 3.5 million ha are perennial crops and vegetables while 6 million ha remain fallow only 3 million ha equipped for irrigation, fainted crop farming predominates.

Table 1. Livestock resource and production by animal types.

Years	Total sheep and goats (million)	Total cattle (million)
1960	50.09	13.5
1980	67.67	15.9
1999	37.50	11.0

Livestock Resource and Production: Turkey has a large livestock resource, with about 11 million head of cattle, 37.5 million sheep and goats and 2-3 million other large animals, many of which are used for draft purposes (Gençkan et al., 1977).

Animal production has close relationships with the other sectors of agriculture and prevents the dangers of a monocultural type of farming. In the various sectors of agriculture and more particularly in the livestock productivity in Turkey through improved feeding and animal management, better health care and upgrading of the genetic base is substantial.

GRASSLANDS

Rangelands, which have been grazed by livestock for thousand of years, are basic source of forage in Turkey. At the beginning of the 20th century, when 10-12 million people were living in Turkey, a relatively large number of live stocks were grazed on extensive rangelands and there was not a serious range management problem. After the First World War the number of live stock began to increase to meet the demands for various animal products of a growing population. This trend was slow at the beginning. For example, in 1935 when there were 44 million ha of rangeland which occupied 58 percent of the country, their 20 million animal units grazing on this waste area. At the end of the Second World War, when numbers of animal units were the same, the range land area of the nation was reduced to 43 million ha (Bakır, 1971).

Since the second world war, the numbers of livestock have rapidly increased, while very many productive meadows and rangelands have been ploughed under as a result of rapid increase on mechanised farming. Thus, in years from 1940 to 80 around 23-24 million ha of rangelands were plowed, while the numbers of livestock have increased.

Table 2. Discussion of rangeland, livestock and stocking rate.

Years	Rangeland (million ha)	Livestock (million AU)	Stocking rate (AU/ha)
1960	28.6	26.4	1.08
1980	21.7	28.7	0.75
2000	21.8	25.9	0.84

Today there are 21.7 million ha of grazing land in Turkey and 28.7 million animal units. The trends already indicate that massive increases in livestock numbers have occurred throughout the last three to four decades.

FORAGE CROPS

Forage crop production in Turkey is presently limited to only a few species such as alfalfa, vetches and sainfoin and the area of these crops are not sufficient to meet the needs of the country. It can be seen that this amount is rather low. The forage crop production in developed countries contrast strongly with that in Turkey. The area for cultivation of these species can in no way be compared with those countries. It is bitter fact that many species cultivated in other countries are not grown in Turkey. As a paradox, the origins of most of these various and valuable forage plants can be

traced back to Turkey. It is possible to observe these plants in the natural vegetation of Turkey (Çelen et al., 1998).

It is considered that there are two main reasons for the lack of development of forage crop growing in Turkey. First of all, the marketing and price policy of animal products has not been efficiently regulated. Every farmer can sell his crop production easily, but it is not so easy and the price is not so satisfactory for animal products such as milk. Secondly, most of our farmers have only a small area of land and they do not want to grow forage crops for their few unproductive animals. The number of big animal reamers is low and some of them are nomadic people. The main occupation on these small farmers is field crop production and animal rearing is considered as a side occupation (Bakır, 1971).

A productive pastoral farming system requires a large and reliable supply of feed and its efficient utilisation by the animal. The type of pastoral system which involves in a particular region will depend upon the interaction of such factors as the environment, the supply of technical information on the soil-plant-animal complex, the type of animal enterprise and the economic status of the producer (White, 1977). Indeed, many farmers and even some agronomists in Turkey are unaware of the benefits of forage crops.

SUGGESTIONS TO INCREASE FORAGE CROP PRODUCTION

It is widely believed that there are very many experiments which have to be conducted in order to establish the materials most suitable for forage crop cultivation in Turkey, but the material that is already in hand is enough to start the programme of forage crop production which the country urgently needs.

Agricultural extension service can do a lot in this field. In Turkey there are forage crop producers who don't know where they can sell their seeds. Also, there are a large number of farmers, want to buy forage crop seeds for their farms but can't achieve to the right places to buy them. Most farmers have not considered whether they can produce forage crops on their farms or not, and it is necessary to teach these farmers why and how they produce better forage crops. Extension work is, therefore, very necessary and useful for forage crop production in Turkey. Extension services should use some demonstration methods such as, radio, television, periodicals, newspapers, etc. to give useful information to farmers. These information may contain selection of land that suitable for special forage crops, using good quality seed, application of suitable fertiliser, using right machinery equipment for different kinds of land preparation, seeding, fertiliser application, harvesting and seed processing of forage crops (Le Buanec, 1996).

The climatic conditions and rainfall distribution is very different from one part to other in Turkey. For example, Most place at the Black Sea coast receives about 2.000 mm of rainfall annually, while central Anatolia receive only 250-mm rainfall. In other parts of Turkey, the rainfall ranks between 250 mm and 2.000 mm, also in some places soil surface is covered by snow during winter season. Moreover, soil characteristics are in very wide rank that these characteristics can be seen as acidic, calcareous, saline, alkaline, sandy, heavy clay soils and areas of flooding (Anonymous, 1973). Irrigation and drainage are necessary on some soils. There are topographical and geographical differences also, and all these factors and their combinations are found in different parts of Turkey. It is generally possible, however, to find one or more forage crop plants to adapt to the specific conditions. Research on forage crops can answer questions such as, which species are suitable for which climate?, when to grow them on which soils?, how to use them and which livestock they are advisable?

Although at present we are not completely in the dark with regard to these questions, as there are several centres carrying out research with these plants, it is necessary to establish more research points and carry out more work on introduction, adaptation and selection in order to find out better varieties for specific regions. Drought resistance, flood tolerance, winter hardiness, better quality, nutritive value, ease of establishment, disease and insect resistance, suitable maturity, earliness, competition with other species and seed and hay production all need to be investigated (Avcioğlu et al., 1998).

There is also a need to improve the methods of forage crop cultivation; Seed and hay production (Le Buanec, 1997), introducing rotation systems with other crops, investigating the possibilities of green manure application, etc.

Programmes and an assessment of the extent to which they meet requirements;

- There are programmes for seed multiplication of improved forage crop material, but these programmes should extend to special seed producers without the co-operation of producers in different regions, the programmes necessary on this item can't be realised. Stabilisation of the forage program from year to year will permit planning the farm enterprise more effectively and will help guard the nation's population from the Hasidic of great fluctuation in supplies of live stock products.

- There are some programmes for the breeding of forage crops in a few centuries, but it is considered that more effort is needed to answer the needs of different regions.

- Forage crops production will inevitably increase very quickly, if programmes that aimed to encourage animal production in the form of milk and meat, etc., are successful.

- Research on seed, hay production and grazing capacity of forage crops should be planned in different regions. Green Manuring and crop rotations are also important subjects for research.

- An efficient extension service is needed to work on most aspects of forage crop production.

- It is necessary to train experts and technicians to work on some of the programmes mentioned above.

SUGGESTIONS TO IMPROVE GRASSLANDS

Pasture Law released on 25 February 1998 changed the approaches to the legislative, technical and social structure of grassland and forage cultivation and described modern techniques to promote forage crop production in the country.

Governmental and local authorities to maintain and to improve existing grazing lands were clearly described and different type of organisations and commissions and boards were structured. Namely,

- These bodies consisting of officials, local authorities and farmers were given full power and responsibilities to take care of pastures, to improve them and to develop forage crop production as an aid to control overgrazing and to take measures for erosion.

- By this law, "Pasture Fund" was created and established within the structure of Ministry of Agriculture, basically far from bureaucratic obstacles in function.

- Since there are enough sources in the budget of "Pasture Fund", pasture improvement studies were started immediately throughout the country in 1998 and very many new projects were developed to raise the land area of forage crops such as legumes (alfalfa, etc.) and grasses.

Main problems in these activities are lack of proper forage crops seed sources including mainly alfalfa and annual medics in addition to the well-trained technical personnel, to reach the targets in terms of grassland and forage crop seed production (alfalfa, grasses, etc.), there are also many obstacles to overcome, that is to say;

- It is necessary to establish more research points and carry out more work on introduction, adaptation and extension in order to find out better varieties for specific

regions (Webber et al. 1976). Drought resistance, flood tolerance, winter hardiness, better quality, nutritive value, ease of establishment, disease and insect resistance, proper maturation, earliness, competition with other species and seed and hay production are among the characteristics to be observed.

- According to the Pasture Law, 21 mil. ha of Turkey's pastures must be improved. Since almost 10% of this grazing area is suitable for irrigation and overseeding, necessary seed supply can be suggested as 42.000 tons (2.1 mil. ha x 20 kg/ha seed) at the beginning.

- Forage crop land area is only 3 % of the cultivated land area in Turkey. First aim of previously mentioned development program is to raise this figure to 20 % in addition to the pasture improvement activities. This approach indicates the necessity of 96.000 tons (4.8 mil. ha x 20 kg/ha seed) of different type of forage crops seed including alfalfa, gradually in near future.

As conclusion, it can be said that there is not a satisfactory alfalfa seed market to meet the demands, which has been highly raised by pasture law in the country (Soya, 1985). However, presence of alfalfa and other forage crops seeds in National Seed Programs and sufficient supply of production for the farmers are of great importance. Working Group on Alfalfa of CIHEAM may provide a great deal of contribution to the policy making efforts for solutions of the problems of Turkey and other Mediterranean countries.

CONCLUSION

Certainly the potential of forage production is tremendous in Turkey, but that potential can be obtained only through full and active measures. Progress will continue if farmers can obtain the Government leadership and support. Pasture law is an excellent opportunity to realise these suggestions.

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