

## ALFALFA SEED PRODUCTION AND ITS PROBLEMS IN TURKEY

Necmettin ÇELİK\*

### SUMMARY

*This article has been prepared to account for the current state of alfalfa seed production, production problems and their solutions in Turkey.*

*There are two best known ecotypes, Kayseri and the oriental (Şark) alfalfas. These are grown mainly in Central and Eastern Anatolia regions. In recent years, however, two cultivars, Peru and Mesa-Sirsa are being widely grown on the Coastal regions.*

*Alfalfa seed is domestically obtained from Kayseri and Şark alfalfas in all regions except Marmara. But within the regions, the best ecology for seed production of alfalfa is found in Central and Eastern Anatolia.*

*In general, alfalfa seed is realized on the fields established especially for hay purpose.*

*Seed production indicates fluctuations among the years. By 1965, some of the produced seed has been exported to, but then whole production has become used domestically.*

*There are serious problems at every stage of seed culture of alfalfa and consequently very low yields. A great portion of the produced seed contains weed seed, dodder and other foreign particles. For this reason, it is very difficult for alfalfa growers to find pure and certified seed at market.*

*In order to solve problems of seed production, a large scale research should be initiated, giving priority to dodder, and results transferred to alfalfa growers immediately. In addition, growers must be supported with economic aids of government. Furthermore, public organizations must distribute certified seed and control the seed standardization.*

### I. INTRODUCTION

There is a great fodder deficiency in the animal husbandry of Turkey. The basic reasons of this deficiency are the decreases in natural grassland areas, increases in animal numbers, and the poor grassland management.

---

\* Member of the teaching staff in Faculty of Agriculture, Uludağ Üniversitesi, Bursa.

In order to remove the fodder shortage, it is necessary that the resources of rough feed must be improved. This may be realized by increasing the acreage and yield of forage plants in the cultivated lands. Today, however, only one and two percents of cultivated areas are left for forage plants culture in Turkey. Of course, such a proportion is very low as compared with 25-60 percents of developed countries.

In 1982, the total acreage of forage crops in Turkey was estimated about 217.000 ha of which 141.000 ha was occupied by alfalfa. Although alfalfa is grown throughout this country and its acreage increases gradually, the expected development has not been achieved yet. As a matter of fact, in the five-year plans, the considerable increases for forage crop culture have been aimed but not realized.

Seed problem has become one of the main reasons for the underdeveloped culture of alfalfa. Indeed, alfalfa growers encounter with difficulties in obtaining clean and certified alfalfa seed.

The most important factors that limit the seed production in Turkey are: (1) lack of the accumulations of the scientific knowledge about alfalfa, (2) insufficient economic aid of government, and (3) lack of plant breeding studies.

There is a great mistake in seed management of alfalfa. This mistake arises from using alfalfa fields of hay for seed production. This kind of practice is not good management to be proposed, because it creates bad conditions for alfalfa left to seed setting.

## 2. CURRENT STATE OF SEED PRODUCTION

Alfalfa culture in Turkey has indicated perpetual increase after its role and importance in animal husbandry had been well understood. As a matter of fact, the acreage of alfalfa varied from 74.000 thousand ha in 1970 to 141.000 thousand ha in 1982 (Table: 1).

Table: 1  
Acreage and Production of Alfalfa Culture by Years

Year	Acreage (1000 ha)	Production (1000 ton)		Seed Production (Ton)
		Fresh	Hay	
1970	74	1045	339	3600
1971	78	993	436	3000
1972	87	763	390	1000
1973	91	1144	404	573
1974	95	1100	399	500
1975	95	1000	425	3300
1976	98	1130	580	1500
1977	100	1002	588	2400
1978	110	1250	575	1700
1979	129	1336	651	2500
1980	131	1380	625	2200
1981	143	1622	665	3000
1982	141	1937	645	2806

Source: Agricultural Structure and Production, 1982 Turkey.

Similar advances are observed in the fresh and dry forage productions of alfalfa during the same period. However, seed production fluctuated from 1970 to 1982. Indeed, the production of alfalfa seed reached at the record level with 3600 tons in 1970, and dropped at the lowest level of 500 tons in 1974. After 1974, however, the increase and decrease in seed production have followed each other, but never dropping below 1500 tons a year.

By 1965, some amount of seed had been exported to, but then all of the seed became used domestically, Dodder and the cultivar mixture have been preventive factors of the exportation.

Alfalfa crop is cultivated at every region of Turkey, being most widespread on Central and Eastern Anatolia (Table: 2). From this point of view, the least acreage appears in the South-East Anatolia.

Table: 2  
Acreage and Production of Alfalfa in Regions (1982)

Region	Acreage (1000 ha)	Production (1000 ton)		Seed Production (Ton)
		Fresh	Hay	
Eastern Anatolia	46	129	201	861
Central Anatolia	29	797	95	792
Black Sea	16	103	103	600
Meditarranean	9	314	15	256
Aegean	20	392	81	254
South East	1	10	5	43
Marmara	20	193	144	000

Source: Agricultural Structure and Production, 1982 Turkey.

Eastern and Central Anatolia produce higher fresh and dry forages than the other regions.

About the similar trend is observed in seed production among the regions. The higher seed production of alfalfa is produced in Eastern and Central Anatolia with 861 and 792 tons respectively. In this context, there is no seed production in Marmara Region.

Alfalfa seed is marketed by growers, retailers or Organization of Agricultural Equipment Foundation.

### 3. SEED PRODUCTION PROBLEMS

There is a great problem with variety to be grown in Turkey. In fact, Kayseri and Şark alfalfas are the main ecotypes grown all over the country. However, these are more widely grown on Eastern and Central Anatolia because of their cold resistance. But, some foreign cultivars tested on these two regions yielded more forage and seed than the native ecotypes (Tosun, F., Manga, İ., Altın, M., 1974; Manga, İ., 1974; Çelik, N., 1987; Açıkgöz, E. Ekiz, H., Karagöz, A., 1987).

On the other hand, in recent years, two new varieties, Peru and Mesa-Sirsa were imported and introduced into Coastal regions and became dominant over native alfalfas. These are the varieties bred for mild climates.

Certainly, all of these native and imported alfalfas are not enough to meet the need of Turkey due to much variations in climate.

Variety problem may be solved with continuous and more trials.

### 3.1. Soil and Seed-bed Preparations

As indicated before, alfalfa seed is generally obtained from fields established for hay forage. Due to this practice, there is no any pronounced difference in the soil and seed-bed preparations of seed and hay culture of alfalfa. Whereas, such a practice lowers yield and quality of seed. Most of the time, just one cultivation of soil is accepted good enough to prepare soil. But excellent soil and seed-bed preparations are necessary for alfalfa to yield higher seed since it has taproot and small seed. Seedbed should be firm, fine, free from weeds and level. Such a seedbed is best obtained by plowing deep first, then light tillage, levelling and cultipacking the soil prior to planting.

Ground water may be a problem on some sites. This matter is mostly left out and causes great losses of seed and forage. For that reason, growers must be careful on soils having ground water problem.

### 3.2. Seeding

Turkish farmer generally plants alfalfa in fall at coastal regions and in spring on the more cold regions. These are proper times for alfalfa seeding in respect of its ecological needs. Certainly, excellent stands are obtained from fall seedings. However, growers make some mistakes to choose proper time in fall and spring seasons. For instance, if seedings are made too early or too late from fall rains, then poor stands are obtained. Also, a late spring seeding yields bad results. Alfalfa growers must be cautioned against this kind of mistakes.

As to the seeding method, broadcasting is widely used throughout Turkey. Of course, this is not an excellent method, especially for seed culture of alfalfa. Indeed, 3 to 3.5 kg seed per decare is used by broadcasting method. Certainly, this is quite too much seed when compared with the rate of 0.5 to 1 kg per decare sown by drill seeding. Also, drill seeding has advantages over broadcasting in weed control.

Lacks of technical knowledge and economic impossibilities are the basic reasons for growers not to use alternative seeding methods. Though, some growers have cereal drills, but they do not adjust and use them.

Results of experiments throughout the world suggest that alfalfa must be planted for seed production in wide row spacings such as 60 to 90 cm.

### 3.3. Stand Care

#### 3.3.1. Controlling Pests

Alfalfa growers in Turkey do not pay much attention for pest control and so great losses in seed and forage yields occur. In addition, seed contains different foreign materials such as weed seeds, dodder and insect remnants.

An other important problem occurring on alfalfa fields is rat damages. But, no methods of control are effectively used in this area.

### 3.3.2. Fertilization and Inoculation

In Turkey, there is almost no fertilizer use in alfalfa culture except manure which is sometimes applied by growers. However, adequate phosphorus is essential for satisfactory seed production. Experiments conducted on central and Eastern Anatolia indicate that phosphorus fertilizer increased seed yield considerably (Madanoğlu, 1977; Çelik, 1987).

Inoculation of alfalfa with nodule bacteria is necessary if soil lacks of them. To be sure that they are present, inoculation must be done in any way. Alfalfa growers in Turkey sometimes actuate inoculation by transferring the soil with bacteria from old alfalfa field to new establishments.

### 3.3.3. Irrigation

The seed crop should receive only enough water to promote a moderate top growth. In this respect, some irrigation mistakes are also observed in farmer fields. In general, seed growers irrigate alfalfa for seed with infrequent but abundant water. Also, they sometimes water the plant when it is blooming. All of these mispractices generally lower the seed yield.

### 3.3.4. Timing The Flowering Period

The alfalfa flower must be tripped to pollinate and set seed. This is actuated best by primarily wild bees and honeybees (Pedersen ve ark., 1972; Özkaynak, 1965).

The flowering period should be timed to coincide with the period of the least competition from other pollen sources and the greatest activity of the pollinators.

Seed producers in this country think that alfalfa flower is important only in the honey production.

At coastal regions, the alfalfa is left to set seed after two cuttings. But, the first or second crop is left for seed settings in Central and Eastern Regions respectively. These are relatively good managements for seed setting but require somewhat more care.

### 3.3.5. Time to Harvest Seed and The Seed Storage

The alfalfa seed crop is ready to harvest when 2/3 to 3/4 of the pods are black or brown. However, farmers make mistakes in determination of harvest time. Sometimes, too early or too late harvests occur on the farmer fields. This kind of harvests means more seed losses.

Harvesting, threshing and cleaning are generally made with traditional or somewhat primitive methods. So, there are considerable seed losses in these processes. Whereas, today, in modern seed culture, seed crop of alfalfa is sprayed with desiccants and harvested with combines, decreasing significantly seed losses.

Some significant problems occur also in seed storage. Mostly, farmers store alfalfa seed as it is harvested. Fresh seed contains high moisture of 35 %. When seed is stored its moisture content must be about 12 %. However, there are little problem with seed storage in Central and Eastern Regions where most of the seed is produced and the relative humidity is low. In fact, experiments indicate that alfalfa seed remained alive and vigor to a great extent about 15-20 years in Central Anatolia (Bakır, 1970).

## CONCLUSIONS

Alfalfa culture in Turkey shows gradual increase by years but this increase had not been realized at expected level. Kayseri and Şark ecotypes of alfalfa are widely grown in Central and Eastern Anatolia Regions. But varieties such as Peru and Mesa-Sirsa are predominant at Coastal Regions. The Central and Eastern Anatolia regions contain available conditions of ecology for alfalfa seed production.

Up to date, seed production of alfalfa has indicated continuous fluctuations. Alfalfa grower either produces or obtains from free market his seed need. A great amount of seeds contains weed seed, dodder and some remnants of other pests. All of these indicate that there are significant problems in seed culture of alfalfa in Turkey.

In order to solve the problems of seed production and to increase acreage of alfalfa, a large-scale research should be initiated, giving priority to dodder, and results transferred to growers immediately. In addition, growers must be supported with the economic aid of government. Furthermore, distribution and standardization control of alfalfa seed have to be conducted by public organizations.

## KAYNAKLAR

- AÇIKGÖZ, E., EKİZ, H., KARAGÖZ, A., 1987. Ankara kıraç koşullarında bazı yonca çeşitlerinin verim ve önemli tarımsal özellikleri. *U.Ü. Ziraat Fakültesi Dergisi*, 3: 33-39.
- AVCIOĞLU, R., SOYA, H., 1977. Yonca. *Ege Üniversitesi Ziraat Fakültesi Zootekni Derneği Yayınları*, No: 4.
- BAKIR, Ö., ERAÇ, A., TOKLUOĞLU, M., 1970. Bazı önemli yem bitkileri tohumlarının çimlenme güçlerini muhafaza süreleri üzerinde araştırmalar. *Çayır-Mer'a Yem Bitkileri ve Zootekni Araştırma Yayınları No: 8*, Ankara.
- ÇELİK, N., 1987. Şark Yoncası (*Medicago sativa* L.)'nde sıra aralığı, sulama rejimi ve fosforlu gübre uygulamalarının tohum verimi ve kriterlerine etkileri. *U.Ü. Ziraat Fakültesi Dergisi*, Cilt: 4, s. 67-75, Bursa.
- MADANOĞLU, F.K., 1977. Orta Anadolu koşullarında yoncada fosfor-su ilişkileri ve su tüketimi. *Merkez Topraksu Araş. Ens. Müd. Yayınları*. Genel Yayın No: 43, Araştırma Raporları No: 11, Ankara.
- MANGA, İ., 1974. Erzurum ekolojik koşullarında önemli yonca varyetelerinin bazı agronomik, morfolojik ve biyolojik özellikleri üzerinde araştırmalar (Profesörlük takdim tezi - Basılmamış).
- ÖZKAYNAK, İ., 1965. Ankara şartlarında Kayseri Yoncası (*Medicago sativa* L.)'nin tohum tutma özellikleri üzerinde araştırmalar (Doktora tezi - Basılmamış).
- PEDERSEN, M.W., BOHART, G.E., MARBLE, V.L. and KLOSTERMEYER, E.C., 1972. Seed production practices. In *Alfalfa Science and Technology*. American Society of Agronomy, Inc., Publisher, Madison, Wisconsin, USA.
- TOSUN, F., MANGA, İ., ALTIN, M., 1974. Erzurum ekolojik şartlarında bazı önemli yonca varyetelerinin adaptasyon ve verim denemeleri. *Ata. Univ. Zir. Fak. Ziraat Dergisi*, Cilt: 100, Sayı: 3-4, s. 53-74, Erzurum.