
Focus on Seed Programs

THE SYRIAN SEED INDUSTRY

Abdul Mohsen Said Omar, General Organization for Seed Multiplication, P.O. Box 5857, Aleppo, Syria. Tel: ++963-21-4650291-4; Fax: ++963-21-4644901, 4650295; E-mail: gosm@mail.sy



Introduction

Syria is located at 35°N latitude and 38°E longitude in the eastern shore of the Mediterranean sea bordering Turkey in the west and north, Iraq and Jordan in the east, and Lebanon and Palestine in the South. The estimated population is about 18 million with annual growth rate of 3.2%.

In Syria, the climate is distinctively continental with cool and rainy winters and dry hot summers. There are five agroecological zones based on average annual rainfall: Zone 1 (>350mm), Zone 2 (300-350mm), Zone 3 (250-300mm), Zone 4 (200-250mm) and Zone 5 (<200mm). Syria covers an area of 18.5 million ha of which 14.6, 13.3, 7.1 9.9 and 55.1% are located in Zone 1, 2,3,4 and 5, respectively. From the total land area about 5.7 million ha (31%) is cultivated. Most of the cultivated area (83%) is rainfed while the remaining 17% is irrigated mostly for wheat and cotton production.

The major crops grown are cereals (85%), legumes (7%), oil and industrial crops (8%). Wheat (300-600mm) and barley (250-300) are dominant crops in Zone 1 and Zone 2, respectively. However, apart from wheat and barley other crops such as legumes, summer

crops, fruit trees and vegetables are also planted in Zone 1 and 2. Barley, legumes and forage crops (Zone 3) and Barley and permanent pastures (Zone 4) are the main crops whereas desert and rangelands are the main vegetation in Zone 5.

Agriculture contributes about 20-25% to the national economy and employs 29% of the population. Agriculture provides raw input for the industry and foreign exchange earnings through exports. The major government objective is to achieve self-sufficiency, particularly in wheat, barley, potato, sugar beet and cotton. Table 1 shows the average area and production of major winter and summer crops in Syria.

National Seed Policy and Legislation

The government considers agriculture is of strategic importance and take an overall responsibility for production and/or supply of inputs, including improved seeds. The Ministry of Agriculture and Agrarian Reform (MAAR) established the General Organization for Seed Multiplication (GOSM) which became operational in 1975.

Table 1. Average cultivated area (ha) and production (tonnes) of major agricultural crops in Syria

Crop	Area in ha	Production (tonnes)
Wheat	1684	4745
Barley	1303	1955
Maize	64	216
Chickpea	87	60
Lentil	139	177
Faba bean	15	28
Potato	21	462
Soybean	2	4
Sunflower	1	3
Cotton	257	1010
Sugar beet	27	1215
Total	3600	9875

National Seed Policy

The main objectives of the General Organization for Seed Multiplication are to:

- Organize seed multiplication of released crop varieties through contract with private farmers, farmers cooperatives or state farms
- Establish seed processing and storage facilities at strategic seed production sites
- Market and distribute seed through the Agricultural Cooperative Bank or directly to farmers
- Provide training on seed production and advisory service to farmers through demonstrations

GOSM has played a significant role in improving agricultural productivity by promoting the use of high quality seed of improved crop varieties. For example, seed of high yielding varieties resistant to diseases is available at relatively low prices (60% higher than grain price). The organization has been able to meet the entire national seed demand for some strategic crops such as cotton and sugar beet (100%) and about 70% for wheat and potato.

Seed Legislation

At present the public sector is responsible for agricultural research and crop improvement for the major crops. There is no private sector plant breeding and variety development. Moreover, there are no separate laws and regulations governing variety release and registration, seed quality control and certification, international seed trade and plant variety protection. It should be noted that efforts are now underway to draft national seed policy, laws and regulations to address these important issues in the seed sector.

However, the government has promulgated the Plant Quarantine Regulations in 1960 which was amended in 1991.

Agricultural Research and Crop Improvement

In Syria, the government is reforming its agricultural research institutions and has recently established the General Commission for Scientific Agricultural Research with a view to implementing more

effective agricultural research and crop improvement programs. There are also efforts underway to institutionalize alternative crop improvement strategies in marginal areas for crops such as barley, in which participatory plant breeding is showing great promise for increased adoption and diffusion of new varieties.

GCSAR has eight research stations located in Aleppo, Damascus, Deir Ez-Zor, Hassakeh, Homs, Hama and Lattakia governorates where the research activities sufficiently cover key agroecological zones of the country. Moreover, GCSAR has eight departments of which field crops and horticultural crops remain one of the main research departments.

Variety Development

Agricultural research and crop improvement is the responsibility of the General Commission for Scientific Agricultural Research (GCSAR) based in Damascus and the Cotton Bureau (CB) based in Aleppo Governorates.

The GCSAR is responsible for the development of varieties of food crops in partnership with the International Center for Agricultural Research in the Dry Areas (ICARDA) and the Arab Center for Studies of Arid Zones and Dry Lands (ACSAD) based in Aleppo and Damascus, respectively.

The Cotton Bureau is a semi-autonomous agency under the Ministry of Agriculture and Agrarian Reform and is responsible for research on cotton in collaboration with other national and international organizations. Moreover, the Cotton Bureau is also responsible for supervising the production, quality control, ginning and marketing of cotton.

Variety Release and Registration

The General Commission for Scientific Agricultural Research conducts variety

evaluation mostly through joint collaborative activities with ICARDA or ACSAD. Locally developed or introduced varieties are tested for yield and other agronomic characteristics in verification trials and compared with well-adapted commercial varieties in different agroecological zones. If a variety is found superior to the standard check, a detailed report is prepared and submitted to the National Release Committee formed by the Minister of Agriculture and Agrarian Reform. The committee is chaired by the Minister of MAAR and composed of representatives from GCSAR, GOSM, universities and the Department of Plant Protection, Department of Agricultural Affairs and Directorate of Planning and Statistics from MAAR.

The National Release Committee examines and reviews detailed testing reports of candidate varieties based on the request of GCSAR. If candidate varieties show better value for cultivation and use, the Committee advises the Minister of MAAR to release the variety for commercial use. There are no obvious bottlenecks in the variety release system. However, the entire process of variety development, evaluation, release and registration for example in wheat could take up to 14 years. After a variety is released, GOSM obtains breeder seed from the concerned research center to start initial seed multiplication. The source and number of crop varieties released and currently under multiplication are shown in Table 2.

Variety Maintenance

The General Commission for Scientific and Agricultural Research is responsible for maintenance of the varieties released by the public research organizations. However, GOSM also has seed farms and maintains obsolete improved wheat varieties and multiplies seed of some local landraces of barley, chickpea, sesame and vetch for distribution to farmers.

Table 2. Number of crop varieties released and multiplied by the General Organization for Seed Multiplication, Syria

Crop	GCSAR	ICARDA	ACSAD	CB	Imported	Total
Wheat	11	6	1	-	-	18
Barley	8	3	-	-	-	11
Maize	4	-	-	-	-	4
Sorghum	3	-	-	-	-	3
Faba bean	2	-	-	-	-	2
Chickpea	-	5	-	-	-	5
Lentil	4	4	-	-	-	8
Soybean	-	-	-	-	1	1
Pea	-	-	-	-	2	2
Cotton	-	-	-	5	-	5
Potato	-	-	-	-	17	17
Total	32	14	1	5	20	72

Seed Production

Seed production of released varieties starts from breeder seed supplied by the research programs. For self-pollinated crops five generations are followed for seed production: breeder seed, basic seed, registered seed, certified seed 1 and certified seed 2. For cross-pollinated the multiplication ends at certified seed.

Seed production of major food crops is exclusively a public sector activity. This is a conscious government decision in order to stabilize production and ensure food security. The GOSM is a public sector enterprise under the Ministry of Agriculture and Agrarian Reform. It is responsible for seed production of major crops such as wheat, barley, maize, chickpea, lentil, bean, soybean, cotton and potato, sunflower and sugar beet.

For potato, imported elite seed is used to produce Class A seed for local distribution. The organization has a tissue culture

laboratory and green house facilities to produce disease free planting materials. In case of sunflower and sugar beet limited quantity of seed is directly imported and distributed to farmers. The quantity of seed produced during 1992-2001 is shown in Table 3. From 1992 to 2001, on average about 246,612 tonnes of seed was produced and distributed.

For all crops seed is produced on contract

or state farms. All contract growers should have access to irrigation as an insurance against drought and crop failures to ensure stable seed production and supply.

GOSM receives seed requests five to seven months ahead of planting time to ensure adequate planning for seed production.

The private sector is responsible for seed production (or import) and distribution of horticultural crops such as vegetable and flower seed to farmers.

Table 3. Quantity of seed (tonnes) of major crops produced from 1992-2001 in Syria

Crops	1992	1993	1994	1995	1996	1997	١٩٩٨	١٩٩٩	٢٠٠٠	٢٠٠١
Wheat	163282	162665	174181	200496	146200	213477	186653	148533	221414	127159
Barley	10420	13812	9600	9458	3025	4214	2110	30250	1071	9649
Maize	3286	2054	1903	2369	1227	2372	2148	1585	552	409
Sorghum	1	3	-	-	-	-	-	-	-	-
Faba bean	2002	1015	130	585	4	13.54	128	284	376	275
Chickpea	916	587	253	450	760	1231	1014	310	346	344
Lentil	2336	1975	1615	3765	900	302	1044	168	400	5264
Pea nut	128	15	1	1	-	-	-	-	-	-
Soybean	830	544	257	105	127	90.48	191	74	125.72	93
Sesame	8	-	-	-	-	-	-	-	-	-
Potato	52294	34500	36284	37764	14564	8576	26636	20718	21393	23718
Chard	10.6	-	-	-	-	-	-	-	-	-
Spinach	19.4	-	-	-	-	-	-	-	-	-
Pea	70	270	-	-	-	-	-	-	-	-
Cotton	29530	28763	24300	26300	28649	35825	39505	33830	29262	21973
Sugar beet	45	235	462	-	-	-	-	-	-	-
Total	265178	246438	248986	281320	195456	266101	259429	235752	274939	188884

Seed Processing

The General Organization for Seed Multiplication is responsible for seed processing and has 11 seed centers in different regions of the country. These centers are located in Hassakeh (5), Raqqa (2), Aleppo (1), Hama (2), and Izra'a (1). Each seed plant has a capacity of 8 to 10 t hr⁻¹, but some plants are obsolete with old equipment or poorly maintained. The seed is cleaned, treated and packaged in 50 kg polypropylene bags. The seed crops being processed are wheat, barley, maize and soybean.

The organization also has seed storage facilities and distribution points attached to each seed processing plant. However, there is lack of adequate storage facilities to accommodate seed until distribution time.

Seed Marketing

In Syria, seed is marketed through three main channels: GOSM branches, the Agricultural Cooperative Bank (ACB) and the General Organization for Livestock. GOSM has nine branches and

seven offices located in major crop production regions of the country and sell seed directly to farmers or ACB. The Agricultural Credit Bank has 114 branches distributed all over the country. The Bank offers loans (at 7%) to farmers for seed purchase, and pays the money not to the farmers but directly to the GOSM. It is estimated that about 10% of seed is sold directly to farmers on cash by GOSM whereas the remaining is distributed through ACB on credit.

Moreover, the General Organization for Livestock has branches distributed all over the country dealing with crops such as maize and soybean.

GOSM takes the following measures to ensure that quality seed reaches farmers at the right time:

- Advertises available seed of different crops through public media particularly television.
- Receives seed requests 5-7 months ahead of planting time (May for winter crops and August for summer crops). Requests are submitted to GOSM and ACB branches with 5-7% down

payment for seed.

- Sells seed at cost price to encourage farmers to use improved seed. For some crops it may charge a profit of 5 to 10%.

However, seed marketing and distribution suffers from constraints such as:

- Limited period of time between processing and distribution where large quantities of seed should be prepared
- Lack of sufficient storage facilities to store processed seed until distribution by GOSM or ACB
- Shortage of transport vehicles for distribution causing delays in seed delivery to farmers
- although it is sold at cost price to encourage use of certified seed

Seed Quality Control

The seed quality control is the responsibility of the General Organization for Seed Multiplication.

Field and seed standards for internal seed quality control have been established where crop inspection and seed testing are part of the quality assurance program. Since there is no formal seed certification program, detailed quality control activities are carried out by the same seed producing organization during production, processing and storage operations.

Contract seed growers and production fields are selected based on specific criteria to ensure proper crop rotation, isolation, etc. to produce quality seed. The selected fields are located on the map and the crop inspected at several stages -- before planting, during growing period, and finally at full maturity to decide for provisional acceptance of the seed crop. Field inspectors supervise the harvesting, bagging, labeling, and transportation of seed to processing centers. After harvest samples are drawn from each seed lot, tested and compared with standards

that are specified in the contract. Based on the results of these tests seed lots are accepted or

higher price for better quality seed.

At processing plants all seed lots are sampled while receiving and tested for physical purity, other seeds, and noxious weeds before being cleaned where they are compared with results obtained from samples drawn after harvest. After processing, samples from each seed lot are analyzed for physical purity, germination, seed health (e.g. bunt), insect infestation and treatment coverage and approved for marketing and distribution. The following year post control tests are also planted in the field to check all possible quality problems of seed distributed the previous year.

Seed Import and Export

In Syria, the Plant Quarantine Regulation was promulgated under Law No. 237 of 1960. In 1991, the regulation was superseded by Decision No.21/T of the Ministry of Agriculture and Agrarian Reform. The Directorate of Plant Protection of the Ministry is responsible for enforcing the quarantine regulation. The presence of the pathogen in the country and its economic importance were taken into consideration in setting the standards where three levels/groups of quarantine diseases and pests have been identified.

For quarantine purposes a certificate of origin issued by an official institution in the country of origin and a phytosanitary certificate issued by the plant quarantine service of the country of origin are required. Syria imports seed of sugar beet, sunflower and elite seed of potato from Western Europe to produce Class A potato seed. Moreover, the private sector also imports vegetable seeds.

During the past ten years GOSM exported seed of wheat, barley, faba bean, chickpea,

pea, maize, lentil and potato to Algeria, Jordan, Lebanon, Libya, Saudi Arabia, United Arab Emirates and Turkey. In 1990 about 17,870 tonnes of wheat and potato was exported compared to 7,635 tonnes of wheat, barley chickpea and potato in 1993. National self-sufficiency in seed is a priority whereas seed export is based on demand from the countries of the region in case of emergency situation.

International Membership

The General Organization for Seed Multiplication believes that the integration of the national seed programs would be of great benefit to the countries of the WANA region. It is expected that countries with adequate expertise, facilities and favorable environmental conditions may produce quality seed of agricultural and horticultural crops for export within or outside the region.

The seed testing laboratory of GOSM is a member of the International Seed Testing Association (ISTA) and participates in referee tests organized by the association.

The General Organization for Seed Multiplication is a founding member of the WANA Seed Network and very keen in promoting the objectives and implementing

seed standards for major agricultural and horticultural crops. As a result field and seed standards from 16 member countries have been prepared for major agricultural (cereals, legumes, oil seeds, industrial and forage crops) and horticultural (beans, cabbage, carrot, cucumber, egg plant, onion, pepper,

potato, tomato, water melon) crops. It is anticipated that the standards will form the basis for harmonization of seed quality control and certification in the region.

Recommendations

In Syria, improved seed of major crops is produced exclusively by the public sector. For strategic crops that are crucial for food self-sufficiency and food security, it is suggested that the public sector should be given more support to play a greater role in seed production and supply.

In horticultural (vegetables, ornamentals) or other crops where the General Organization for Seed multiplication does not have the expertise and facilities to produce seed, the private sector should be encouraged to enter the seed market within the government agricultural and national seed policy framework. Joint venture companies could be established in partnership between public seed agencies or private firms. The partnership could be supported where appropriate with access to credit and processing facilities.

The government should review the existing national seed policy and remove the constraints that hinder seed production particularly the establishment of an independent seed certification agency. Such a review should also assess the efficiency and effectiveness of existing seed production and distribution system and identify areas where it can be strengthened. An integrated strategy that encourages exchange of seed among different regions, and focuses on national issues can help strengthen the seed sector in the country.