

# Focus on Seed Programs

## The Algerian Seed Industry

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### The Agricultural Sector

Algeria has a total land area of 238 million hectares (ha) of which 47 million ha is suitable for agriculture. From the 47 million ha, 8 million ha is arable land, 7 million ha is forests and grassland and 3.2 million ha is under urban use. The agricultural sector contributes 12% to net national income and employs 25% of the active population.

The primary objectives of the agricultural sector are: (a) improvement of national food security; (b) protection and conservation of natural resources; and (c) improvement of living conditions and creation of employment in rural areas.

During the last decade, the average yearly growth rate of the agriculture sector was 5%. The average area and crop production per year is shown in Table 1.

Table 1. Average area and production of major crops in Algeria

Crop	Area (ha)	Production (tonnes)
Cereals	3,000,000	2,000,000
Food legumes	80,000	48,000
Vegetables	270,000	3,300,000
Fruit trees	420,000	1,200,000
Total	3,770,000	5,548,000

## National Seed Policy and Regulations

An organized seed sector started with the establishment of cereal breeding activities in 1905. Cereal seed production and marketing was initiated in 1945 based on a decree dated 28 September 1938. Since the establishment of the seed program, there has been a continuous progress in the number of varieties developed and released as well as the quantity of seed produced and distributed.

However, the Algerian seed sector went through major structural and functional changes in the 1990s. Until this time, seed production and marketing was entirely under public enterprises whereas agricultural research institutes carried out seed quality control. With the opening of the country to the international market, a series of measures were taken which have affected the seed sector significantly. The most important measures are:

- Liberalization of agricultural inputs and seed prices (except for wheat)
- Liberalization of foreign or external commerce/trade
- Dissolution of public enterprises and emergence of a private sector
- Reorganization of the national seed sector including
  - Establishment of official agency (CNCC) responsible for variety catalogue, quality control and certification based on Decree No 92-133 dated 28 March 1992 (1992)
  - Endorsement of Decree No 93-284

dated 23 November 1993 to regulate the production and marketing of seed and planting material of released varieties

- Regulations for establishing seed and planting material production or marketing enterprises ; more than 300 enterprises are now benefiting from this arrangement

The legislation has two main parts, the general institutional framework and specific technical regulations.

The general texts include:

- Introduction of compulsory quality control and certification for seed and planting material production and marketing
- Introduction of the official national variety catalogue and temporary lists
- Establishment of committees to improve performance of the seed sector through establishment of:
  - National committee for seed and planting material
  - Committee for approving seed production enterprises
  - Committee for approving seed marketing enterprises

The specific guidelines include:

- Technical regulations for organizing seed production for each group of crops
- Regulations for listing varieties for seed production and marketing, setting seed health standards and conditions for establishing seed enterprises

## Variety Development, Evaluation and Release

In Algeria, variety development and testing are primarily under public sector organizations

### Variety Development

The agricultural research institutes, organized by commodity programs, are responsible for variety development and testing (Table 2). These institutions include: (a) Technical Institute for Field Crops (Institut des Grandes Cultures, ITGC); (b) Technical Institute for Vegetable Crops (Institut des Cultures

Maraîchères, ITCMI); and (c) Technical Institute for Fruit Trees and Grape (Institut L'Arboriculture Fruitière et la Viticulture, ITAF). Based on variety trials, the most promising lines are submitted to CNCC for registration in the official variety catalogue.

Although, the legislation permits both domestic and foreign private seed companies to develop varieties, they have not yet entered and invested in plant breeding. However, there are partnership arrangements with European breeders for crop improvement. For example for potato, European breeders submit their varieties through their representatives in Algeria.

Table 2. Agricultural Research Institutes in Algeria

Institute	Tasks	Experimental stations
Institut Technique des Grandes Cultures (ITGC)	Development and testing new varieties of cereals, legumes, forage and oil crops.	Guelma, Khroub, Sétif, Beni-Slimane, Oued-Smar, Khemis-Miliana, Tiaret, Sidi-Bel-Abbès, Saïda (9).
Institut Technique de l'Arboriculture Fruitière et de la Vigne (ITAF)	Agricultural research on fruit trees, nuts, olives and citrus	Constantine, Skikda, Béjaïa, Médéa, Boufarik, Blida, Tessala Mohamadia, Tighenif, Mascara (10)
Institut Technique de Cultures Maraîchères et Industrielles (ITCMI)	Agricultural research on potato, vegetables and industrial crops	Staoueli, Isser, Hassi-Bounif, Sidi-Bel-Abbès, Oum-El-Bouaghi, Annaba, Zeralda (7).
Institut National de la Recherche Agronomique (INRAA)	Agricultural research on all cultivated species	Mahdi-Boualem, Touggourt, Hamadia, Béjaïa, Adrar (5).

### Variety Evaluation

After the new varieties are identified by the agricultural research institutes, they must be tested for Distinctness, Uniformity and Stability (DUS) as well as for their Value for Cultivation and Use (VCU) before registration in the official catalogue. Both DUS and VCU tests are

conducted by the Centre National de Contrôle et de Certification des Semences et Plants (CNCC) for about three consecutive growing seasons; UPOV guidelines are used particularly for description purposes.

After three years of testing, the results are presented to the Technical Committee for

Variety Release which was established by the Ministerial Decree No 93-284 of 23 November 1993. The composition and functions of the technical committee for variety release are determined by the Ministerial decision of 8 June 1998. The Technical Committee for Variety Release is chaired by the Director of Variety Protection and Technical Control and it consists of representatives from:

- Directorate of Regulations and Agricultural Development (DRDPA – MA)
- Centre National de Contrôle et de Certification des Semences et Plants (CNCC)
- Technical institute responsible for the particular crop under discussion i.e. ITGC, ITAF or ITCMI
- Institut National de la Recherche Agronomique (INRA)
- The National Chamber for Agriculture
- The Inter-professional Council

concerned with the species under registration

- Institut National Agronomique (INA)

Each institution has one representative on the Technical Committee for Variety Release.

The committee is responsible for all activities related to variety release and registration in the official catalogue. The Committee reviews the research results of DUS and VCU tests and recommends the registration of those varieties to the Ministry of Agriculture, if found satisfactory. Varieties are officially registered in either A or B list. The committee is also consulted in case of dispute.

Moreover, the committee prepares proposals for variety regulations and encourages wider adoption and diffusion of new varieties.

The national variety catalogue was introduced in 2000 and so far a total of 24 cereals and 13 potato varieties are officially registered (Table 3).

Table 3. List of some varieties registered in the official catalogue

Durum wheat	Sersou, Ouarsenis, Hoggar, Waha S
Barley	Ain el Fouara, Majestic, Vertige, Princess, Djebel, Nickel, Saida, Rihane
Oats	Hammel, Cannelle, Bahri and Gharbi
Potato	Adora, Armada, Argos, Cantate, Diamant, Fabula, Remarka, Valor, Vivaldi, Coralie, Désirée, Kuroda, Oscar, Dura.

During the next two years, most of the varieties in the temporary lists will enter into the official variety catalogue including those which predated the establishment of the catalogue.

#### **Variety Maintenance**

Variety maintenance is the responsibility of the agricultural research institutes. For example ITGC is responsible for cereals

where maintenance of varieties is carried out in all research stations. At each station the task of variety maintenance is assigned to a staff member who together with CNCC staff is responsible for the quality control of the maintenance work. For cereals, three maintenance procedures are used: (a) progeny testing using ear-rows; (b) progeny testing using families; and (c) progeny testing using subfamilies. At present about 51 varieties are maintained comprising 30 wheat, 8 rice, 9 oat and 4 triticale.

Vegetable seed production is limited in quantity and is carried out by ITCMI. For fruit trees, the number of plants produced is about 50 million plants per year.

### Seed Production

Seed production follows a generation system, namely: breeder ( $G_0$ ,  $G_1$ ,  $G_2$ ), Pre-basic ( $G_3$ ), basic ( $G_4$ ), Registered ( $R_1$ ) and Registered 2 ( $R_2$ ).

In addition to variety development, the agricultural research institutions are responsible for variety maintenance, breeder, pre-basic and basic seed production. Both public and private sector enterprises are responsible for certified seed and planting material production. The main producers are: (a) OAIC/CCLS (field crops); (b) private cooperatives and state farms (fruit trees and grapes); and private enterprises (potato). The seed production for cereals is briefly presented here as an

example.

For cereals, certified seed production is carried out under the umbrella of the Office Algérien Interprofessionnel des Céréales (OAIC), a parastatal organization with a network of 35 cooperatives known as Cereals and Food Legume Cooperatives (Coopératives de Céréales et de Légumes Secs = CCLS). The cooperatives are located in major cereal and legume growing areas of the country and function as seed producing enterprises. The network includes about 2000 private seed growers. At the national level, the seed production program is organized with an average of 3000 ha per cooperative including a network of seed processing and storage facilities which can also serve as distribution points.

The CCLS network produces and distributes on average 200,000 tonnes of certified and commercial seed of cereals. The proportion of certified and commercial seed produced varies from season to season. In seasons of normal rainfall, certified seed production is higher whereas in case of drought years more commercial seed is approved for planting purposes. The quantity of seed distributed during the last 5 years is reasonably stable at around 150,000 to 200,000 tonnes/year compared to an estimated annual cereal seed requirement of 400,000 tonnes (Table 4). The average area covered by 'formal sector' seed is between 3.2 and 3.7 million ha/year.

Table 4. Quantities of cereal seed produced from 1997/98 to 1999/00

Year	Production (tonnes)
1997/98	148,750
1998/1999	149,200
1999/2000	196,200

The remaining cereal seed requirement is covered from farm-saved seed and the local market. The amount of cereal seed exchanged within the informal sector is estimated to be 10,000 tonnes with the remainder coming from farm-saved seeds.

Seed cleaning and treatment services are provided through the CCLS to farmers who use own saved seed for planting. However, these services are not well organized and are even not available in some regions, although the capacity of existing plants may reach 250,000 tonnes during three months processing operation.

### Seed Processing and Storage

The seed processing stations are distributed all over cereal production regions of the entire country. The network of cereal cooperatives has 26 seed processing stations of which 12 have a cleaning capacity of 25 tonnes/day and 14 can handle 40 tonnes/day.

Seed storage facilities are also found in each processing stations. There are 12 stations with a storage capacity of 3,500 tonnes and 14 stations with 4,400 tonnes each.

### Seed Marketing

Seed marketing is carried out through the CCLS network in 480 distribution points. The distribution of the selling points allows farmers easy access to seed.

The seed price for cereals, legumes, potato, fruit trees and grapes is liberalized except for wheat, which is fixed (Table 5). For wheat seed a variable level of subsidy is given based on grain price on the international market. Apart from the premium paid to seed growers (10-15%) there is also support from the national fund for agricultural development where credits are given to seed suppliers who purchase seed from the CCLS.

Table 5. Grain and seed prices in 2001

Crop	Price in Algerian Dinar/quintal			
	Grain price	Premium for seed producers	Total	Certified seed price
Barley	1.000	.150	1.150	1.66
Bread wheat	1.700	.255	1.955	2.465
Durum wheat	1.900	.285	2.185	2.695
Oats	1.100	.165	1.265	1.775

The Ministry of Agriculture licenses the establishments to market seed. All applications for licenses are examined by

the technical committee of CNCC which provide the Ministry with expert advice.

## Seed Import-Export

Seed import is based on the national seed quality and phytosanitary standards and is restricted to the list of registered varieties based on clause No 116 and 117 of seed marketing regulation dated 21 May 1995.

For seed export, the seed should have a definitive certificate and the exporter should have a valid seed and planting material marketing license from the Ministry of Agriculture.

Quarantine activities are based on Law No 87-17 of 1 August 1987 (phytosanitary protection) and the Executive Decree No 93-286 of 23 November 1993 (regulating phytosanitary control at the borders). The Directorate of Plant Protection and Technical Control is responsible for implementing these regulations. The inspectors of the directorate are posted at all entry points to the country particularly the seaports and the airports.

## Seed Quality Control and Certification

With the liberalization of the seed sector, the role of the public sector is limited to establishing and implementing an adequate quality control and certification system. Since the early 1990s, the government has put in place a quality control and certification system for seed and planting material. The Centre National de Contrôle et de Certification des Semences et Plants (CNCC) is responsible for quality control and certification of seed and planting material. CNCC also conducts DUS and VCU trials for release and registration and manages the national variety catalogue. In addition it provides assistance to seed production and marketing enterprises and ensures that they meet the required quality standards.

The CNCC is responsible for inspection of seed production fields and verifies that varietal purity and identity are maintained and other field standards are observed. Seed quality attributes such as purity and germination are tested in three CNCC laboratories. The testing methods and procedures are based on ISTA rules. Each year an average of 8,000 cereal seed samples are tested.

## Informal Sector

The informal sector consists of local seed production and supply and may include local traders and farmers. Seed is exchanged or traded in small quantities in the local market or saved on farm and there is no guarantee for quality and health of seed and planting material. About 200,000 tonnes of cereal seed come from farm-saved seed or local exchange for planting. There are no detailed statistics on the quantity of seed exchanged at a local level but it is estimated that it may reach 10,000 tonnes of cereal seed consisting mainly of barley, oat, durum wheat and sorghum. It also includes exchange of vegetables such as tomato, spices and melon and planting material of tree crops such as olive, pomegranate, pear and almond.

## Technical Cooperation and Training

The Algerian national seed sector has bilateral cooperation with the German Agency for Technical Cooperation (GTZ) under which technical assistance and training is conducted in field crops and fruit trees. The professional staff from agricultural research institutions and CNCC benefited from the training opportunities in various disciplines. Moreover, short-term consultancies are also provided based on the project objectives and the needs of the national seed sector.

Practical training courses are organized every year for crop inspectors to update their knowledge. The staff from seed production enterprises also benefit from such training to enable them to execute their technical tasks effectively. On average about 250 staff are trained each year.

### International Relations

Algeria is in the process to join international organizations related to seed activities such as ISTA and OECD. The applications have already been accepted and this will considerably simplify the process of becoming a member of both organizations. The administrative preparations are now under way. In case of UPOV, Algeria attends the general assembly as an observer.

Algeria is also a founding member of the WANA Seed Network and a 'lead country' in compiling seed industry costs in member countries.

### Constraints in the Seed Sector

The following are the main constraints of the national seed sector in Algeria:

- Insufficient progress in plant breeding
- Unattractive price for cereal seed growers
- Lack of technical capacity for production of seed and planting material
- Strong competition from imported potato and vegetable seed

- Inadequate financial resources allocated to research institutes
- Lack of professional organizations related to seed

### Recommendations

Two seed laws have been prepared and are being examined by the competent authorities. The first is on seeds and planting material and the second on plant variety protection, this based on a UPOV-type model law.

Two studies have been initiated within the framework of the cooperation agreement between Algeria and Germany (GTZ) to reorganize the seed sector. These studies are expected to formulate appropriate recommendations to reorganize the national seed sector. The authorities of different institutions and representatives of public sector are engaged in a serious dialogue on these issues.

The main recommendations are:

- Adjust prices relative to cost of production to attract more private sector investment
- Assist in establishing on-farm and specialized seed processing equipment
- Stimulate professional and inter-professional organizations for active participation in the seed sector
- Training to upgrade the knowledge of staff in the seed sector
- Allocate adequate budgets for the research institutes
- Enact and implement laws for plant variety protection



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