

THE ROLE OF SEED AND SEEDLINGS CERTIFICATION & CONTROL CENTER IN ACHIEVING FOOD SECURITY

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Abstract:

The National Center for Seed and Seedling Control and Certification is deemed one of the most important official institutional mechanisms for achieving food security in Algeria, through the powers and tasks entrusted to it, most particularly after the inauguration of the National Seed Bank in 2022, and the state's endeavor to preserve the genetic heritage of Algerian seeds and work to develop and adapt them to climate changes, thereby ensuring increased productivity, reducing the import bill, and moving towards smart and sustainable agriculture.

keywords: Food security, sustainable agriculture, seeds and seedlings, agricultural production, food safety.

Introduction:

Food security today, constitutes a central political and economic issue for all countries, as each country endeavors to ensure this safety and find the necessary mechanisms to address the dangerous repercussions that nature might cause for one reason or another. Indeed, it can even pose a threat to the social, economic, and political aspect of the society¹. The climate change that Algeria experienced, like other countries of the world, has compelled the State to consider developing a national strategy to secure its food, given that the country, according to experts, import more than 80% of seeds². This places a heavy burden on the public treasury, and threatens the reserves of foreign exchange, as well as risks that may arise from achieving high productivity. In an attempt to implement its strategy, Algeria has allocated substantial material and human resources and established various institutions and committees to work toward achieving its objectives.

¹ Hamdani, R., & Bekadi, F. (2016). Food Security and Sustainable Development, Center of the Academic Book, P. 12.

² Statement by the President of the National Union of Agricultural Engineers to the Algerian Radio on February 21, 2021, published on the website. <https://radioalgerie.dz/news/ar/article/20210210/206998.html>

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The Center is one of the most important institutions established by the State for the aim to achieve its food strategy in light of the difficult climate challenges whether related to wheat, potatoes, or other products. Indeed, an abundant production cannot be achieved without seeds of a known source and composition. Thus; importing seeds from abroad to cultivate them in large areas may lead to a collapse in the food system if these seeds are not productive and do not provide a significant productivity. This may conflict with the estimations that specialist relied upon.

Seed quality is the starting point towards the goal to achieve a significant agricultural productivity across various seeds varieties and at all levels, regardless of the regions where they will be cultivated. Given Algeria's diverse geography, from north to south³, it is necessary to take this peculiarity into consideration by improving and developing seeds that are compatible with the desert environment. Field results have demonstrated the effectiveness of their yield, provided that all appropriate means are provided to control and maintain them.

The State has also embodied its policy in this domain through inaugurating the National Bank of Seeds, officially on August 11th, 2022⁴. This initiative constitutes an attempt to protect the genetic heritage of the different national agricultural components, which in turn will compel the agricultural sector to fully rely on Algerian seeds instead of imported ones.

In light of the aforementioned factors, the significance of this research becomes evident and the following questions are raised:

What role does the National Center of Seeds and Plants Certification & Control play in achieving food security in Algeria?

To answer this question, the researcher adopted the analytical approach which is the most relevant to this study. The researcher analyzed various legal texts in this regard.

**THE FIRST TOPIC: TASKS OF THE NATIONAL CENTER OF SEEDS AND PLANTS
CERTIFICATION & CONTROL**

In this section, we will address the tasks entrusted to the center under study, and then we will examine the legal regulations governing seeds and seedlings in Algeria.

FIRST REQUIREMENT: THE CENTER'S TASKS

First, it is important to note that the National Center of Seeds and Plants Certification & Control, is a state institution of an administrative nature, that enjoys judicial personality and financial independence, in accordance with Article 1 of the Executive Decree No 92-133, dated in 1992. According to Article 2, the Center supervised by the Minister of Agriculture, and its headquarters is located in Algiers⁵.

³ Al-Arabi, I. (1983). *The Sahara Desert and Its Coasts*. National Book Foundation.

⁴ See : https://www.annasronline.com/index.php?option=com_content&view=article&id=232126.

⁵ It has the following website : <https://cncc.dz/>

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The center's task includes controlling seeds and seedlings, certifying them, and managing the official catalog of cultivated plant varieties and their types⁶. And pursuant to Article 4, the center is specifically attributed the following duties:

- Overseeing the generation of seeds and seedling during their vegetative stage.
- Monitoring the physiological, natural and health peculiarities in the laboratory phase of all the seeds or seedlings domestically produced and/or imported.
- Controlling their storage conditions.
- Authenticating them before any marketing or utilization.
- Issuing official certification documents, the type of which is determined by the Minister of Agriculture.
- Suggesting any regulatory legislation in this domain and working for its application.

In terms for managing the Official Catalog of plants varieties and types, the center is specifically tasked with the following⁷:

- Issuing the technical regulations that govern procedures of registering and/or deleting cultivated plants varieties.
- Conducting approval test on these varieties before registering them in the Official Catalog.
- Preserving reference sample or data of varieties registered in the Official Catalog.
- Creating complete files for each indexed variety and preserving them.

The center is also assigned, in accordance with Article 6 of the same decree, to organize and provide technical assistance to producers and storage entities involved in its activities. In this framework, its tasks constitute in the following:

- Generalizing techniques related to its goal through the use of all appropriate resources and means, as well as organizing advisory sessions.
- Contributing to the creation of Educational and Professional Training Program, organizing training sessions, and defining qualifications for the benefit of seeds producers, in addition to providing technical supervision of institutions and bodies responsible for producing, adapting, preserving and marketing seeds.
- Conducting any research and experimental work related to monitoring and certifying seeds and seedlings, along with approving cultivated plants varieties with and their types.
- Issuing expertise for third parties regarding the quality of domestically produced and/or imported seeds and seedlings.

In the same context, Article 8 adds the following tasks:

- Take the initiative to organize scientific and technical events, exhibitions, seminars, and conferences related to its objective.
- Concluding all the contracts, agreement and deals related to its objective with national or foreign bodies in accordance with the applicable legislation after acceptance from the competent body.

To do so, the center must allocate all human and material resources. This is confirmed by Article 7, which entails that the government shall provide the center with the necessary financial working tools, laboratories, fields for conducting experiments, workshops for research and experimentation. In this framework, it is important to refer to the powers of the National Committee of Seeds and Seedlings that are fundamentally related to its functions with the

⁶ See Article 3 of the Executive Decree, No 92-133, dated in 1992.

⁷ See Article 5 of the Executive Decree, No 92-133, dated in 1992.

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Center. Article 2 of the Executive Decree No 06-246, dated 2006, assigns the committee the following tasks⁸:

- Supervising and coordinating initiatives for the production seeds and seedlings.
- Considering all the technical and/or economic regulatory measures essential for the development of the national production of seeds and seedlings and their marketing.
- Considering technical draft for their production and marketing.
- Examining applications for the recording of varieties in the Official Catalog and/or their removal therefrom.
- Reviewing applications for granting certification to produce and sell of seeds and seedlings.

Based on the aforementioned, we may say that there is a complimentary and interconnected relationship between the center's tasks and that of the National Committee of Seeds and Seedlings. This what calls for the necessity to issue an effective coordination between these two institutions to achieve intended goals.

SECOND REQUIREMENT: LEGAL REGULATIONS OF SEEDS AND SEEDLINGS

The terms "seeds and seedlings" refer to seeds and complete plants or parts of these plants that can be used in the agricultural production or reproduction, which must comply with the applicable technical and phytosanitary standards⁹.

In this context, the legislator has determined a set of legal rules related to methods of producing and classifying seeds and seedlings, their storage, certification, packaging and labeling.

According to Article 19 or the Law 03-05, the activity or any natural or judicial person involved in the production, reproduction and wholesale or semi-whole sale of seeds and seedlings are subject to a prior accreditation system.

According to Article 20, Natural or judicial persons who produce and reproduce seeds and seedlings may do so directly or through a third person. The Executive Decree 07-100 dated March 29, 2007, determined the conditions for accrediting practices related to the production, reproduction and wholesale or semi-whole sale of seeds and seedlings, as well as modalities of granting it. The Article also outlined the documents that must be provided and presented to the competent authorities for obtaining the necessary accreditation whether for natural or judicial persons¹⁰.

Article 21 mandated that land parcels utilized for the production or reproduction of seeds and seedlings regardless of their ownership system or legal usage conditions, must be subject to an annual declaration to the National Phytotechnical Authority. These parcels must also be maintained in good phytotechnical conditions.

⁸ Executive Decree No. 06-246, dated 13 Jumada al-Awwal 1427, corresponding to July 9, 2006, defines the powers, composition, and functioning of the National Seed and Seedling Committee. Official Journal, No. 46, published on July 16, 2006.

⁹ See Article 03 of Law No. 05-03, dated 2005, on seeds, seedlings, and plant variety protection..

¹⁰ For further details, see Articles 02 of the Executive Decree No. 07-100, dated March 29, 2007, which defines the conditions for accrediting practices related to seed and seedling production, reproduction, or wholesale and semi-wholesale sale, as well as the procedures for granting such accreditation. Official Journal, No. 22, published on April 4, 2007.

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According to Article 22, natural or judicial persons who import, produce, or reproduce seeds and seedlings must confirm that the plant material they provide to users complies with the appropriate conditions and is recorded in the official catalog of plant varieties. In the same context, Article 17 states that only certified varieties registered as such in the official catalog are authorized for production, reproduction, importation, exportation, distribution, and marketing.

Indeed, Article 1 of the executive Decree No. 06-2016, dated June 18, 2006, states that, in compliance to the rules of Article 16 of Law No. 05-03, Dated Dhul-Hijjah 1425, corresponding to February 6th, 2005, this decree specifies the conditions of classifying seeds and seedlings as well as certification modalities.

And according to Article 2 of the same Decree, seeds and seedlings are categorized into the following types:

- Pre- basic and basic seeds and seedlings.
- Certified seeds and seedlings.
- Uniform seeds and seedlings.

According to Article 3 of the same executive decree, institutions that are in charge of the certification process shall approve seeds and seedlings under the oversight of the National Technical Plant Authority. It is the Minister of Agriculture who decides on the conditions for appointing institutions for the tasks thereof.

The approval of seeds and seedlings validates the conformity of the production methods for seeds and seedlings, which are defined by technical regulations according to species or groups of species specified by a decision from the Minister of Agriculture¹¹.

Article 5 stipulates that technical regulations mentioned in Article 4, as well as the approval procedures, must relate to the following:

- The botanical technical characteristics that the seeds and seedlings of these species must meet.
- Modalities for their classification into the categories specified in Article 2 above, based on their technical qualities and botanical health.
- The production and packaging modalities.
- The legislator has left the door open for interested parties through the text of Article 6, which states that the methods specified in this decree can be clarified, if necessary, by a decision from the Minister of Agriculture.

Article 7 emphasizes that those who commit violations in terms of the approval and of seeds and seedlings will be subject to the penalties stipulated in the legislation in force.

As for the storage, packaging and labeling of seeds and seedlings, the legislator has addressed these by virtue of the Executive Decree No 06-217, dated June 18, 2006¹². This

¹¹ See Article 04 of the Executive Decree No. 06-216, dated June 18, 2006, which defines the conditions for seed and seedling classification and the procedures for their certification. Official Journal, No. 41, published on June 21, 2006.

¹² The Executive Decree No. 06-217, dated June 18, 2006, defines the conditions for seed and seedling storage, packaging, and labeling. Official Journal, No. 41, published on June 21, 2006.

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Decree was promulgated in accordance of the provisions of Article 23 of the Law No 03-05, dated February 6, 2005.

In accordance with Article 2 of the same decree, the conditions for storing seeds and seedlings are determined by technical regulations based on species and groups of species, as set forth by a decision from the Minister of Agriculture.

Seeds can only be marketed in airtight packaging that guarantees that they are kept under optimal conditions¹³. Furthermore, the methods for implementing the provisions of this Article 3 can be clarified, if necessary, by a decision from the Minister of Agriculture. In the same context, Article 4, outlines that seedlings can be marketed in the form of bundles for bare-root seedlings. They may also be sold in containers that ensure their quality of the seedling.

Article 5 mandates that, in addition to the trade labels that remain subject to applicable regulations, an official indelible mark must be established for seeds and seedlings. This mark should be put on the seed packaging or affixed to the bundles.

According to Article 6 of Executive Decree No. 06-217, the official label for the relevant seeds and seedlings must include the following information:

- The commonly used name
- The scientific name
- The variety and/or graft
- Lot number
- Production year
- Production share
- The oversight visa of the National Technical Plant Authority agent.

The approved and uniform pre-basic or basic categories are represented using labels in different colors. The characteristics of these official labels, as well as their colors, are determined by a decision from the Minister of Agriculture.

According to Article 7, individuals who commit violations related to the storage, packaging, and labeling of seeds and seedlings are subject to the penalties stipulated in the applicable legislation.

Pursuant to Article 54 of Law 05-03 dated 2005, the oversight of seed and seedling production and reproduction processes, and the examination of the rights of holders, is conducted by the technical plant inspectors affiliated with the National Technical Plant Authority. This also includes the judicial police and all competent bodies, including the Center object of this study.

Monitoring is conducted at the national level in nurseries and production fields to ensure compliance with production and reproduction standards for each category of seeds and seedlings, as stated in Article 57. Furthermore, technical and phytosanitary monitoring is performed throughout the export of seeds and seedlings in line with Article 61 of the same law.

¹³ See Article 03 of Executive Decree No. 06-217.

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The legislator set forth a set of penalties related to violations of the aforementioned conditions. Persons who illegally produce, reproduce, import, export, distribute, or market uncertified seeds and seedlings not registered in the official catalog face imprisonment for a period between (2) and (6) months, along with a fine ranging from one million Algerian dinars (1,000,000 DZD) to one million five hundred thousand dinars (1,500,000 DZD). Moreover, any seeds and seedlings involved in the violation will be confiscated. In cases of repeated offenses, the penalties are doubles as outlined in Article 68. And those who distribute or sell seeds and seedlings in breach of the labeling, storage, packaging, and labeling requirements set forth in Articles 17 and 23 of this law face a fine ranging from one million Algerian dinars (1,000,000 DZD) to one million five hundred thousand dinars (1,500,000 DZD), according to Article 70.

As outlined in Article 71, anyone who produces, reproduces, distributes, or sell seeds and seedlings without the necessary accreditation set forth in Article 19 of this law will face a fine between one million Algerian dinars (1,000,000 DZD) and one million five hundred thousand dinars (1,500,000 DZD). Furthermore, any seeds and seedlings they possess will be confiscated and for repeat offenses, the fine will be doubled.

In the same context, According to Article 72, these individuals must adhere to the following:

- The certified plant varieties recorded in the official catalog.
- The categorization conducted under the provisions of Article 13, and it is found that these seeds and seedlings do not comply with the declared variety or classification due to their actions or actions related to their responsibility, shall be punished with imprisonment for a period of two (2) to six (6) months and a fine ranging from one million dinars (1,000,000 DZD) to one million five hundred thousand dinars (1,500,000 DZD).

The seeds and seedlings involved in the breach will be seized, and the person who commits the violation may also be required to compensate for the damage caused by their violation. In the case of repeated violations, the penalty is doubled.

In accordance with Article 73, the National Technical Plant Authority has the authority to prohibit the marketing of any protected variety that has been produced or reproduced in a manner that does not meet the specified requirements. This decision must be communicated to the holder of the rights or the licensee.

THE SECOND TOPIC: THE LEGAL FRAMEWORK REGULATING THE CENTER

Based on Article 9, the Center is supervised by a Guidance Council and managed by a General Director.

FIRST REQUIREMENT: THE SUPERVISORY COUNCIL

The law has granted the Supervisory Council of the center with several powers. According to Article 10 of Executive Decree 92-133, the Supervisory Council deliberates on the following matters in particular:

- The structure of the center and its operational procedures.
- The annual plans and multi-year programs and the outcomes of the previous year.

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- The annual plans and multi-year programs aligned with the center's objective.
 - The projected revenues, expenses, and budget of the center.
 - The internal regulations governing the organization and functioning of the center.
 - The general terms for entering into contracts, agreements, and tenders.
 - Projects for constructing, acquiring, selling, and exchanging buildings.
 - Acceptance of donations and legacies and their allocation.
 - The recommended actions for the supervisory authority to enhance and advance the center, as well as to provide direction for its various areas of work.
 - All initiatives designed to enhance the center's operations and support its goal attainment.
- And the Guidance Council is composed of¹⁴:
- The Minister of Agriculture their representative as the chair.
 - A representative of the Minister of Finance.
 - A representative of the Minister of Commerce.
 - A representative of the National Planning Council.
 - Representatives of the bodies in charge of collecting, preserving, and marketing seeds and seedlings.
 - A representative of the technical and administrative staff at the center.
 - A representative elected by the farmers.

The General Director and the accounting agent of the center attend in an advisory capacity the meetings of the Supervisory Council, with the General Director also acting as the council's secretary. The Supervisory Council may also invite any individual it considers competent in the matters under discussion or who may be beneficial to its deliberations.

According to Article 12, members of the Guidance Council are selected for their expertise in the field and are appointed by the Minister of Agriculture for a period of three (3) years based on proposals from the authorities to which they belong. If a position on the Guidance Council¹⁵ becomes vacant, it will be filled within one (1) month at most from the date of the vacancy, following the procedure outlined in Article 12.

According to Article 14, the Supervisory Council convenes at least twice a year for regular sessions, upon the invitation of its chair. Furthermore, it can be convened for an extraordinary session at the request of the chair, one-third of its members, or a proposal from the General Director. The chair prepares the agenda, and invitations are sent out along with the agenda at least fifteen (15) days prior to the meeting date. The notice period for extraordinary meetings can be reduced, but not to less than eight (8) days.

The discussions of the Supervisory Council are deemed valid only when the majority of its members are present. If a quorum is not met, a new meeting will be scheduled within seven days of the first meeting. In this case, the Council can proceed with discussions regardless of how many members are present¹⁶.

¹⁴ See Article 11 of the Executive Decree, No 92-133, dated in 1992.

¹⁵ See Article 13 of the Executive Decree, No 92-133, dated in 1992.

¹⁶ See Article 15 of the Executive Decree, No 92-133, dated in 1992.

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Decisions made by the Supervisory Council are approved by a simple majority of the votes from the members present. In the event of a tie, the chair's vote will be decisive.

SECOND REQUIREMENT: THE CENTER'S GENERAL DIRECTOR

We begin by noting that the Director General of the center is appointed by the executive decree based on the proposal of the Minister of Agriculture, and his duties are terminated in the same manner according to Article 17. According to Article 18, the Director General implements the decisions of the Supervisory Council and is responsible for the overall operations of the center, which he manages within the framework of the applicable regulations.

In this capacity, he undertakes the following:

- He acts on behalf of the center and represent it before courts and in all civil matters.
- He conducts activity reports to be submitted to the Supervising Authority.
- He is responsible for disbursing the center's budget according to the conditions outlined in the applicable laws and regulations.
- He prepares the estimated budget and commits to operational and capital expenditures, authorizing their disbursement.
- He concludes all contracts, agreements, and deals related to the center's work program.
- He exercises authority over all employees in the center and appoints individuals to all positions for which no other appointment method has been established.
- He attends meetings of the Guidance Council and monitors the implementation of its legally approved decisions.

It is important to note that the center has both central and decentralized interests in order to achieve its objectives¹⁷.

In this context, it is important to highlight that there is no legal text that specifies the composition of the Scientific Council of the Center as stated in Article 21, which stipulates: "The center shall have a Scientific Council, the organization, functions, and operations of which shall be determined by a decision from the supervising Minister based on a proposal from the Director General¹⁸."

The internal system of the National Seed and Seedling Control Center, as outlined in Article 2, is governed by the Director General, who is assisted by the Secretary General. The internal structure includes the following components:

At the central level:

- Administration and Resources Department
- Field Crops Department
- Leguminous Crops Department
- Fruit Crops and Trees Department

¹⁷ See Article 19 of the Executive Decree, No 92-133, dated in 1992.

¹⁸ And this is whether in the center's website or the website of the Ministry of Agriculture, Rural Development and Fisheries.

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- Central Laboratory

At the regional level:

- Two regional branches.

According to Article 3, the Administration and Resources Department consists of the Users and Social Activity Unit, Accounting and Budget Unit, and Public Resources Unit. As for the Field Crops Department, according to Article 4, it includes the Index Unit, Field Trials Unit, and Field Monitoring Unit. In accordance with Article 5, the Leguminous Crops Department is composed of the Index Unit, Field Trials Unit, and Field Monitoring Unit. Finally, the Fruit Crops and Trees Department, as per Article 6, consists of the Index Unit, Field Trials Unit, and Pulses Monitoring Unit.

The central laboratory¹⁹ consists of the Sample Management Unit, Analysis Unit, and Health Monitoring Unit. At the regional level, the center has two regional branches, each comprising an Administrative Unit, a Regional Laboratory, a Field Trials Unit, and a Field Monitoring Unit.

According to Article 9, the locations of the regional branches can be determined by a decision from the Minister of Agriculture. Additionally, a senior position as Regional Head may be established if necessary, with the number and location of these regions specified by a joint ministerial decision between the Minister of Agriculture, the Minister of Finance, and the authorities responsible for public service²⁰.

In this context, it is important to mention that the Director General of the center serves as a member of the National Seed and Seedling Committee. Article 3 of Executive Decree No. 06-246 specifies that the committee is led by the Minister of Agriculture or their representative, and it is composed of:

- The Director of Plant Protection and Technical Control or their representative
- The Director of Agricultural Production Control and Development or their representative
- The Director of Real Estate Regulation and Property Protection or their representative
- The Director of Training, Research, and Guidance or their representative
- The Director General of the National Seed and Seedling Control Center or their representative
- The Director General of the Technical Institute for Major Crops or their representative
- The Director General of the Technical Institute for Leguminous and Industrial Crops or their representative
- The Director General of the Technical Institute for Fruit Trees and Vines or their representative
- The Director General of the Technical Institute for Developing Desert Agriculture or their representative

¹⁹ See Article 7 of the joint ministerial decision.

²⁰ See Article 10 of the joint ministerial decision

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- The Director General of the Algerian Institute for Standardization or their representative
- The President of the National Chamber of Agriculture or their representative
- The Presidents of the relevant national professional councils or their representatives
- The Presidents of the specialized technical committees mentioned in Article 5 of this decree or their representatives.
- A representative of the Minister of Trade
- A representative of the Minister of Higher Education
- A representative of the Minister of Industry
- A representative of the Minister of Environment
- A representative of the Minister of Health

The committee's president may request assistance from any individual whose expertise can help the committee in its work. A permanent technical secretariat will manage the committee's responsibilities, and the committee will establish its internal regulations. Members of the committee are appointed for a period of three (3) years, which can be renewed, by a decision from the Minister of Agriculture based on a proposal from the authority to which they belong. The committee involves three (3) competent technical committees: the Technical Committee for Approving Varieties, the Technical Committee for Plant Ownership Protection, and the Technical Committee for Granting Seed and Seedling Production and Sales Accreditations. The organization, composition, and functioning of these committees will be determined by a decision from the Minister of Agriculture²¹.

Conclusion

This study highlights that the National Center for Seed and Seedling Control and Certification plays a crucial role in achieving food security, especially following the inauguration of the National Seed Bank. This is accomplished through the powers and responsibilities assigned to its various departments, and its success depends on the availability of material, human, and technological resources. Moreover, it is noteworthy that the Scientific Council of the Center, as stipulated in Article 21 of Executive Decree No. 92-133 dated 1992, has not been formed, which may affect the smooth functioning of the Center and its bodies. Furthermore, despite more than two years since the inauguration of the Seed Bank, the site lacks numbers and statistics related to its operations, an issue that needs to be addressed to allow all interested parties to access relevant information. Accordingly, we recommend the following:

- Amending the Executive Decree No. 92-133 dated 1992 and updating its provisions to comply with the constitutional amendments of 2020.
- The necessity of dedicating a fully Arabic digital interface on the Center's website that includes detailed information on everything farmers need, as an attempt to ensure the delivery of information to all interested parties and accommodating all levels.
- Including legal provisions that encourage the adoption of modern technological techniques in the Center's execution of its various assigned tasks.
- Urging the establishment of the Scientific Council of the Center and define its composition to keep pace with various scientific developments in the field of specialization.

²¹ See Article 04 of Executive Decree No. 06-246.

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- Allocating a special window on the Center's website that includes data related to the Seed Bank to facilitate the work of researchers and all interested parties, allowing them to reference this information in their studies.

- The necessity for the Center to open up to universities and research laboratories with shared interests to foster scientific dynamism through various recommendations provided by specialists.

- Equipping its laboratories with modern equipment and integrating artificial intelligence into various techniques used, as an attempt to shift towards smart agriculture.

- Focusing on improving and developing seeds that are suitable for desert areas to ensure the highest agricultural yields.

- The necessity of continuous and ongoing coordination with various specialized entities to update information and keep pace with different field developments.

- Working on finding new types and varieties of seeds with high yields by developing existing base varieties and encouraging investors in this field.

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