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Department of Agronomic Sciences

MASTER MEMORY

Natural and life Science
agronomic Sciences
Réf. : ……..

Presented by : Gacem Nahla

Theme :

Évaluation of organic practices applied by farmers in the palm groves of the ouest ziban of Biskra

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Jury :

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Thanking

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I thank the jury members for agreeing to review our work
Our most heartfelt thanks

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dedication

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Chapter I

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Introduction

Organic farming of date palm systems represents the optimum solution for sustainable date palm production through the use of organic fertilizer (compost), biofertilizers and biological control agents. Organic agriculture includes all agricultural systems that promote the environmentally. Organic farming refers to the agricultural systems used to produce food and fiber. Organic farming systems do not use toxic chemical pesticides or fertilizers. Instead, they are based on the development of biological diversity and the maintenance and replenishment of soil fertility. Organic certification includes inspection of farm field and processing facilities. Farm practices inspected include long term soil management buffering between organic farming and any conventional farms, product labeling and recordkeeping. Processing inspections include review of the facilities, cleaning, pest control methods, ingredient transportation, storage and record keeping as well as audit control**(Safouat,2007).**

Date palm (*Phoenix dactylifera* L.) is the main crop of both traditional and modern Algerian Saharan agriculture. The economy of the southern provinces (wilayates) is based primarily on date palm cultivation and utilization of its fruit by-products such as paste, flour, syrup, vinegar, yeast,and confectionery. This provides a major source of income for oasis inhabitants. All parts of the date palm are used, including the leaves and trunks which are used for basketry and house construction. The fruit is consumed in soft and dry forms, processed to produce syrup **(Mimouni and Siboukeur 2011)**.

Algeria is one of the leading countries in the field of date palm cultivation, with more than 18 million palms and more than 800 varieties, the most important of which are Deglet Nour, Ghars and Mech Degla **(Benziouche and Cheriet, 2012)**. Many studies have shown the difficulty of the successful functioning of the downstream date industry (marketing difficulties), especially on the international market **(Belguedj, 2004; Benziouche, 2012)**. This sometimes leads to a phenomenon of genetic erosion and can lead to the abandonment of old palm groves. Taking advantage of external experiences, many mechanisms are applied or being set up in Algeria, for the promotion of exports and the valorization of dates, such as labels «local products» and «organic farming» (OF).

The Ziban region is the most important Phoenician region in Algeria, in quantity and quality, thanks to the variety Deglet Nour. Among these crops we find the date palm, whose

cultivation does not involve many inputs and which, according to specialists, is already equipped with all the elements to make it an organic crop.

The idea of developing the production of organic dates hasstarted in this region for a decade, but in a very timid way through some individual initiatives under the influence of some exporters established in Europe**(Benziouche, 2017).**

The operation has since expanded in several municipalities of the Biskra wilaya. Indeed, the farmers of Ziban's grove follow different practices for centuries; they introduced several tools and improved techniques to facilitate their work. Currently, no database is available on the current state of different farming practices related toorganic farming and the potential to be developed. On the other hand, many projects are already launched in the field by the state to encourage the production of organic dates. For these reasons we carried out our survey to know how close farmers' practices in Zeb el gharbi of Biskra region are to the principles of organic farming.

We have tried to come closer to clarify the situation in most of its manifestations, by studying the current situation. To carry out this work, we followed a research methodology that include several steps in order to achieve the objectives outlined above.

In the first part we conducted a bibliographic search divided into two chapters, in the first chapter we have described all about date palms and dates, and then in the second one we selected the basic concepts of organic agriculture and showed the conversion procedures to organic.For the practical part, we present two chapters. The first concerns the material and methods where we have presented the study area and the second chapter contains the results of our survey we discussed deeply based on other studies and cases.

Finally, we present the conclusion.

Chapter 01

1. Distribution of the date palm

1.1. In the world

The cultivation of date palms is concentrated in the arid regions of the southern Mediterranean and in the southern fringe of the Middle East from the south of Iran in the east to the Atlantic coast of North Africa in the west, between the altitudes of 35° North and 15° South. Spain remains the only country in Europe to produce dates mainly in the famous palm grove of Elche, located west of Alicante at 39 ° North. The date palm is also cultivated on a smaller scale in Mexico, Argentina and Australia. In the United States of America, the date palm was introduced in the eighteenth century but its cultivation really began only around the1900s with the importation of Algerian varieties, in particular Deglet-Nour, and Iraqi varieties **(Hilgeman, 1972).**

1.2. In Algeria

Date palm is grown in numerous oases spread over the southern part of the country, where the climate is hot and dry. The oases are living spaces which have been artificially established in the midst of a large arid area where water is present. In these locations, a ksar (a village made out of clay) was built and date palms were planted around it. These oases systems of complex intensive production are maintained with a very fragile balance. Given the geography of Algeria, it is possible to describe several regions of date palm cultivation **(Bouguedouraandal.,2015)**:

- In the Atlas Mountains foothills (Ksour Ouled Naïl, Zibans, and Aures), there is an oasis chain that marks the gateway of the Sahara.
- In the east, Zibans (Biskra), Oued Righ, Oued Souf (El Oued), and the basin of Ouargla especially with the Deglet Noor cultivar of high commercial value.
- In the west, Saoura (Beni Abbes), the Touat (Adrar), the Gourara (Timimoun), and the Tidikelt (Reggane) where palm groves include cultivars of relatively low commercial quality. It is in this area where the only truly bayoud-resistant cultivar, Taqerbucht, exists.
- At the center. El Golea, the M'zab (Ghardaïa), and Laghouat.

2.Botanical description of the species

2.1. Taxonomy (classification)

The botanical classification of date palm given by **Djerbi (1994)** is as follows:

Kingdom: Plantae

Phylum: Spermatophyta

Subphylum: Angiospermae

Class: Monocotyledonae

Order: Arecales

Family: Arecaceae

Genus: Phoenix

Species:*Phoenix dactylifera*

3.farming techniques

3.1. Cultivation practices

The Saharan zone is characterized by low rainfall (less than 150 mm or even less than 50 mm). The practice of agriculture in this area is only possible with the help of irrigation. The water needs of the crops are closely linked to climatic conditions, in particular evapotranspiration, but also to the nature of the soil, the biology of the plant and its place in the Sahara. The date palm tolerates drought longer than other fruit species, but if it is exposed to a lack of water for an intolerable length of time (several months), the palm reacts with a significant reduction in growth and production and sometimes even a stop of the production. Prolonged water stress on the vegetative organ results in the reduction of the size of the palms and the development of more spines. A palm tree whose palms are dried out is not automatically considered dead. The heart of the palm can survive for a long time (several months) and its growth can restart when the water conditions become favorable. **(Sedra,2003).**

3.2.Multiplication and planting of shoots or 'djebbars'

It is a vegetative multiplication of the palm tree that allows a reproduction and a identical genetic transmission of the parents of the parents characters. The date palm produces, during its life in normal conditions 3 to 30 shoots depending on the varieties, the size, of the offsets and the way the palm growers. **(Sedra,2003).**

It is recommended to encourage the rooting of the shoots close to the ground, by surrounding the base with soil, or of the shoots after their next weaning with the following practices: **(Sedra,2003).**

- Clean the clump and thin out by cutting down the palms, in order to ease access to the shoots to be pulled out
- Choose straight, physiologically sound shoots (young and non-trapus), free of diseases and pests and 2 to 4 years old. The palms of these shoots should be cut back to 30 to 50 cm and pruned so that pruned in such a way that only 2 to 3 rows of palms remain around the heart of the around the heart of the shoot.

- Wean off discharges by professional workers using a sharp tool. tool. A clean cut is recommended to avoid cutting into the mother plant or the mother plant or the shoot.
- Brush the weaning wound of the reject and the mother foot with a healing fungicide.
- Check for disease and/or pest.
- A freshly cut djebbars weight 7 to 25 kg or more, length of 50 cm and diameter of 25 to 35 cm. The resumption in the field of of large shoots is always successful.

3.3.Land preparation and Planting density

As with all irrigated crops, it is necessary to level the soil. In leveling operations, all arable land must never be removed by exposing the bedrock. In the case of steep slope, we will proceed to drop to obtain a terraced area. **(Tourtain ,1967).**

Preparatory tillage must be carried out several months before planting. If the underground is of the same nature as the ground, it is possible to plow the soil, on the other hand, if the subsoil is clayey or finely sandy only the top layer will be ploughed. In light soils, instead of ploughing, holes of one cubic metre will be dug at the location of the trees. **(Tourtain ,1967)**

In phoeniciciculture, another factor comes into play: lighting. Date palms exposed to rain; great sunshine give the best yields. Thus, we recommend plantations with large spacings (10 m and more) oriented East-West. To encourage work (maintenance, underlying crops), square planting is preferred to staggered planting. **(Tourtain ,1967).**

Figure 1 : Djebbar attached to the palm tree. Source: Palmier dattier - www.la-cle-des-oasis.fr

3.4. Irrigation

The irrigation dose per tree per month varies from 9 to 16 m 3 in cold periods (average 12.5 m 3) and from 17 to 25 m 3 (average 21 m 3) in hot periods. It also varies according to the age of the palm trees. In fact, the average annual irrigation dose for a hectare of 100 palm

trees varies from 11,000 to 1,750 m 3. In general, the annual irrigation water requirements per hectare vary according to the age of the palms, their density per hectare, the irrigation method and also the type of irrigation, the irrigation method and also the texture and salinity level of the soil**. (Sedra, 2003).**

Table 1: Gravity irrigation dose and water requirements according to palm age andclimatic conditions

Irrigation dose	Young palms		Adult productive palms	
	Warm season	Cold season	Warm season	Cold season
Variation in requirements (m3/tree/month)	6 to 10	11 to 17	9 to 16	17 to 25
Average per m3/tree/month	8	14	12,5	21
Annual average per m3/ha (100 palms/ha)	11000		16750	

(**Sedra,2003)**

The most practiced irrigation methods are panel irrigation and trough irrigation. For an economy of water use, it has been shown that drip irrigation shown that drip irrigation and especially fert-irrigation has given good results in some localities in traditional palm groves and especially in the areas of extension of the palm grove. **(Sedra,2003).**

3.4.1.Gravity irrigation method

There are two variants of the gravity irrigation method:**(Sedra,2003)**

- by individual circular or square planks: This method is recommended for This method is recommended for plantations where the distances between the palms are high (at least 10 m).
- by a single bed 1.5 to 6 m wide, depending on the age of the palms and 50 to 100 m long, depending on the soil structure. This method is recommended in the case

of young plantations and/or when the distances between palms are small (less than 6 m) or the palms are relatively short.

3.4.2. Drip irrigation method

As in the case of tree species, localized drip irrigation of date palms allows saving water for several years after planting. However, as mentioned, the planted in an orchard watered by this irrigation method and developing a limited root system, require protection by installing installation of windbreaks against strong winds and desert storms to avoid the eventual uprooting of the trees. The amount of water supplied to each palm tree varies according to the soil structure, climatic conditions of the environment and especially of the palm tree. **(Sedra,2003).**

3.5.Fertilization

According to **Hass and Bliss (1935)**, a hectare of 120 palms exports 29 kg of nitrogen, 5 kg of phosphate and 70 kg of potassium, of nitrogen, 5 kg of phosphate and 70 kg of potassium. **Embleton and Cook (1947)** estimated that pruning a one-hectare plantation results in a loss of 25 kg of nitrogen, 2 kg of phosphate and 74 kg of potassium. Fertilization of date palms with organic or mineral fertilizers plays an important role in increasing the productivity of the trees and improving the quality of production.

Its positive and significant effect requires an adequate schedule of complete fertilizer application, the frequency, quantity and quality of fertilizers vary according to the soil texture, irrigation method, age of the palms and the farming system. **(Sedra,2003).**

Table 1: Quantities of organic and mineral fertilizers to be provide for the date palm tree

Fertilizers	Young non-productive palm (kg / tree)	Adult palm tree productive (kg / tree)
Manure or organic fertilizers	5-10 (7,5)	60-240* (150)
Super Phosphate (P2O3)	0,1-0,5 (0,3)	2-3 (2,5)
Potassium Sulfate (K2O)	0,3-0,5 (0,4)	4-6 (5)

Urea or ammonium sulfate (N)	0,1-0,2 (0,15)	2-3 (2,5)

(Sedra,2003) : Average value

3.6. Pollination

Flowering time: Generally, February - March - April for the females and from January for the males. The temperature influences the emergence of the spathes and their opening. An alternation of cold and heat that occurs during the fruiting period could be detrimental to the regularity of floral receptivity and the spathes size. **(Sedra,2003)**

Figure 2: Dhokar. Source: (Sedra,2003)

3.6.1.Methods of pollination

3.6.1.1.Traditional pollination

It is the most practiced technique in the Algerian palm groves: **(Sedra,2003)**

- Release the spikelets of the female inflorescences
- Deposit in the middle of these spikelets 2 to 3 spikelets of mature male flowers and fix them slightly by a lace.

In general, 2 to 4 male trees (good pollinators) are sufficient to pollinate 100 female trees.

Figure 3 : Manuel pollinisation.
Source : (Sedra,2003)

3.6.1.2.Semi-mechanized pollination

This technique consists in bringing the pollen on the female inflorescences at the favorable stage of floral receptivity by powdering from the ground using special device or blower, a plastic bottle containing the pollen, a plastic c tube 5 to 8 meters long and finally a rigid metal tube made of aluminum which is used to fix the plastic tube. The pollen is expelled in the air stream produced and carried in the plastic tube to the inflorescences by repeated pressure on the pear. This method of pollination requires beforehand to **(Sedra,2003 i)**:

Figure 4 : Usage of pollinator

Source : Nourani et al:
Réalisation d'un pollinisateur du palmier dattier - *crstra*

- Collect ripe spikelets of good pollen
- Dry them in the shade for 2 to 4 days depending on the conditions of the environment
- Collect the powdered pollen grains, put them in the appropriate packaging and store it in good conditions.
- Mix the pollen powder during the pollination operation with a chemically inert powder support (preferably talc used in tires) at a rate of 10% in general. One gram of pollen grains mixed with 9 grams of talc (10%) are enough to pollinate 10 to 15 female spathes. This percentage can reach this percentage can reach 40% according to the varieties.

3.7.Limitation and clarification of palms

The operations of limitation and thinning of the bunches by chiseling must be carried out just 1 to 2 weeks after the fruit set (end of May - of beginning of June). They are recommended to **(Sedra,2003)**:

- Increase the dimensions of the date
- Improve its quality
- Prevent its late ripening.
- Alleviate the loads caused by the dates on the spadixes which pull at the apical part of the stem; this can lead to the breakage of the bunches and/or injuries in the apical bud area. These wounds are sites of infection for heart disease or entry points for pests.
- Restore a regular physiological balance to the tree, allowing a regularity of an adequate bloom each year. This allows to heal the phenomenon of alternation.

3.8.Limiting the number of bunches

- For a young palm (4 to 6 years old), it is recommended to remove all the (spathes) during the first three years to avoid slowing down its growth.
- For an adult palm (10 years and older), it is recommended leave 8 to 9 functional green palms. In general, the recommended number of bunches varies from 8 to 12 per tree depending on the varieties and the maintenance conditions of the palm trees.
- Remove bunches that are too far from the upper and lower part of the spathe emission zone, preferably the ones that came out first and last in order to have a homogeneous homogeneity of the maturity of the dates and the size of the bunches.

- To take care on the balance of weight of the bunches, at the level of the bouquet of the tree by a good distribution of the bunches all around the tree. **(Sedra,2003 k)**

Figure 5: Limiting number of branches
source : (Sedra,2003)

3.9. Thinning and chiseling of the bunches

This operation should preferably be carried out early, after 3 to 4 weeks after fruit setting, and it is advisable to carry out this operation at the same time as bunches bending, in order to save time, effort and cost. The objective of this cultivation technique is to reduce the number of spikelets in number and/or in length to promote fruit development, improve its physical quality (size), and reduce quality (dimensions), and to reduce the relative humidity of the air which is often harmful and causes rotting and molding of dates. **(Sedra,2003)**

Figure 6: Thinning the branches

source : (Sedra,2003)

3.10.Protection of dates against rain and humidity

This operation is practiced at the stage "rateb" of the fruit, which corresponds to the last but one stage "tmar", in order to prevent and protect the bunches and dates at the end of the ripening period against rain and high humidity, which may occur at the end of the season. For that, it is advised to use covers in strong paper type Kraft, in the form of cloches. **(Sedra,2003).**

Figure 7: Protecting the dates with kraft paper
source: (Sedra 2003)

3.11.Palm pruning and tree cleaning

For the palm tree, the practice of pruning or trimming the palms is not directly aimed at improving production, but consists in eliminating all the organs of the vegetative and reproductive systems that are drying out or have very limited physiological activity. This operation of cleaning is recommended generally, once a year after the harvest to eliminate **(Sedra ,2003)**:

- The old palms very leaning generally the most attacked by the white scale, the aerial diseases and the other pests
- Deformed, bad or broken palms
- Aerial shoots or "rkebs" that encumber the mother palm
- The palms of the shoots adjacent to the mother trees to facilitate the cultivation practices
- The rest of the spathes, the bunches

- The fruits that have fallen or are stuck between the bases of the old palms pruned

3.12. Harvest

The harvest is an important step to ensure a production of good quality dates of good quality and an aptitude for its marketing

- Either the bunches are cut at ripe (>95% of ripe dates) and collected on a cover on the ground with the help of ropes or other means without harming the dates or contaminate them with soil

Figure 8: Harvesting with robes
source : (Sedra, 2003)

- Or as soon as the dates ripen, is carried out by hand after climbing the tree on a ladder with the help of the pocket with handle. This device consists of a strong canvas bag, held open by a metal frame, extended by a sleeve carried by a metal fork with hook. Applying aback-and-forth movement to the fork, shakes and detaches the ripe fruits, which are led by the handle to a box on the ground.

Figure 9: Harvesting dates by climbing the palms.
source : (Sedra2003r)

Chapter 02

1. Definition

Organic agriculture (OA) is a management system that avoids the use of synthetic pesticides, inorganic fertilizers, and genetically modified organisms (GMOs) and that seeks to reduce pollution (air, soil, and water) and optimize the health and productivity of interdependent communities of plants, animals, and humans. OA has emerged as an option to the problems of chemical usage by conventional agriculture. To meet these objectives, organic farmers need to implement a series of practices that optimize nutrient and energy flows and minimize risk. Organic practices include crop rotations, enhanced crop diversity, different combinations of livestock and crop production, symbiotic nitrogen fixation with legumes, efficient utilization of organic manure and other crop waste streams, and biological pest control **(Müller-Lindenlauf 2009).**

Prior to the arrival of synthesized fertilizers, biocides, medicines, farm mechanization, and fossil fuels, organic agriculture was the sole option **(Kristiansen and Merfield 2006)**. Farmers had no alternative but to work within natural constraints.

2. History

The term "OA" was introduced by a British agriculturalist (Lord WalterNorthbourne) in 1940 in his book "Look to the Land" **(Paull,2010a)**. Northbourne stated the idea that the agricultural space is a competitive space between organicfarming and chemical farming.

Three decades after Northbourne's concept of OA,all streams of agriculture that eschewed synthetic fertilizers and pesticides—includingbiodynamic, organic, biological, and ecologicalwere united in Franceunder the auspices of the newly formed International Federation of OrganicAgriculture Movement (IFOAM) **(Paull,2010b)**. This developmentlaid the groundwork for sharing, extending, and harmonizing local innovations,including discoveries of agricultural practice, standards and certifications,labeling, training, and advocacy into the international arena.

The development of the organic movement continued during the 1960s and 1970s when there was increasing consumer activism associated with concern about anthropomorphic changes to the natural environment **(Pearson and al., 2011)**.

However, it was not until the 1990s that organic received formal recognition as afood production system in many countries. It was at this point that it started to movefrom the fringes into a significant activity in the mainstream food industry. Inaddition to becoming a

possible food production system for the masses, academicresearch on the organic production also started to gain attention **(Pearson and al., 2011)**

There is now a significant body of international research which includes comparisons of many facets of organic farming, including crop production, benefits to biodiversity and soil health **(Fuller and al. 2005; Maderand al. 2002),** and demographics and motives of organic consumers **(Hughnerand al., 2007).** Rodale published the first edition of his periodical Organic Farming and Gardening in 1942. The Australian Organic Farming and Gardening Society were founded in Sydney in 1944 and published the periodical Organic Farming Digest **(Paull, 2008).** A major milestone in OA occurred in 1972 with the founding of theIFOAM at Versailles, France, to unite and foster the organic cause **(Paull, 2010).** The vision of IFOAM (2011) was the worldwide adoption of OA.

Table 3 : Organic agriculture movements

Period	Type of movement	Year	Milestones achieved
1900s to 1960	Reform movement	1924	Introduction of biodynamic farming soil association was founded, spiritual food production, healthy food production
1960 to 1990	Environnemental	1962 1968 1972 1980s	"Silent Spring" by Carson was published, bio-organic farming was introduced International Federation of Organic Agriculture Movement (IFOAM) was founded definition as "eco-agriculture" against pesticides and pro-environment holistic food production standardization, lobbying for worldwide adaptation, marketing environmental superiority
1990	Politicalmovement	1990	Government support promotion, subsidies, funding of research, currently being presented as a solution to the environmental problems caused by conventional agriculture

(Jones 2012; Kirchmannand al. 2008)

3. Principles of Organic Agriculture

OA is an alternative production system that avoids the use of synthetic pesticides and fertilizers, relies on biological pest control, and relies on crop rotation, green manure, compost, and other recycled wastes to maintain soil fertility **(Goh,2011).**

OA is a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity **(Haas and al., 2010**). It emphasizes the use of management practices in preference to the use of off-farm synthetic inputs, taking into account that regional conditions require locally adapted systems **(Haas andal., 2010).**

This is accomplished by using, where possible, agronomic, biological, and mechanical methods, as opposed to using synthetic materials, to fulfill any specific function within the system **(FAO,1999).** The fundamental aim and objective of OA is to enhance the effectiveness of health and productivity of interdependent communities of soil life, plants, animals, and people.

OA is based on certain principles as stated by **Lynch and Truro (2009)**:

• Protect the environment, minimize soil degradation and erosion, decrease pollution, and optimize biological activity and health,

• Maintain soil fertility by optimizing conditions for biological activity within the soil,

• Maintain biological diversity within the system,

• Recycle materials and resources to the greatest extent possible within the enterprise, and

• Rely on renewable resources in locally produced organic food systems.

4. Technical characteristics of organic agriculture:

Organic agriculture requires specific techniques and their good mastery, among these techniques we find**: (B. Nicolardot,2007)**

- The rotation of the cultures by alternating cultures cleaning and dirtying in order to maintain the land clean, to maintain and even improve the quality of the soil and reduce parasite and disease risks. Soil work is generally superficial in order not to alter the physical, chemical and biological fertility of the soil;
- The fertilization forbids the chemical fertilizers of synthesis and values organic matters from the farm (manure, compost, etc.).
- The use of mechanical or thermal mowing to control weeds and other pests.
- The use of genetically modified organisms, cloning and products that have undergone ionization treatment are prohibited
- The phytosanitary protection is a characteristic of organic agriculture through prevention, the choice of appropriate species and varieties, the right date of implantation the choice of rotation, and biological control through prophylaxis.

5. The IFOAM standard for organic production and processing

5.1. Organic ecosystems

5.1.1. Ecosystem Management

General Principles

Organic farming benefits the quality of ecosystems.

Requirements

Operators shall design and implement measures to maintain and improve landscape and enhance biodiversity quality, by maintaining on-farm wildlife refuge habitats or establishing them where none exist. Such habitats may include, but are not limited to:

- Extensive grassland such as moorlands, reed land or dry land;

- In general, all areas which are not under rotation and are not heavily manured: extensive pastures, meadows, extensive grassland, extensive orchards, hedges, hedgerows, edges between agriculture and forest land, groups of trees and/or bushes, and forest and woodland;
- Ecologically rich fallow land or arable land;
- Ecologically diversified (extensive) field margins;
- Waterways, pools, springs, ditches, floodplains, wetlands, swamps and other water-rich areas which are not used for intensive agriculture or aquaculture production;
- Areas with ruderal flora;
- Wildlife corridors that provide linkages and connectivity to native habitat.

Clearing or destruction of High Conservation Value Areas is prohibited. Farming areas installed on land that has been obtained by clearing of HighConservation Value Areas in the preceding 5 years shall not be consideredcompliant with this standard.

5.1.2. Soil and Water Conservation

General Principle

Organic farming methods conserve and improve the soil, maintain water quality and use water efficiently and responsibly.

Requirements

- Operators shall take defined and appropriate measures to prevent erosion andminimize loss of topsoil. Such measures may include, but are not limited to: minimal tillage, contour plowing, crop selection, maintenance of soil plant cover and other management practices that conserve soil.
- Land preparation by burning vegetation or crop residues is prohibited.
- Operators shall return nutrients, organic matter and other resources removed from the soil through harvesting by the recycling, regeneration and addition of organic materials and nutrients.
- Stocking densities and grazing shall not degrade land or pollute water resources. This applies also to all manure management and applications.

- Operators shall prevent or remedy soil and water salinization where these pose a problem.
- Operators shall not deplete nor excessively exploit water resources, and shall seek to preserve water quality. They shall where possible recycle rainwater and monitor water extraction.

6. Inappropriate technologies

General Principle

Organic agriculture and aquaculture are based on the precautionary principle and should prevent significant risks by adopting appropriate technologies and rejecting unpredictable ones.

Requirements

- The deliberate use or negligent introduction of genetically engineered organisms or their derivatives is prohibited. This shall include animals, seed, propagation material, feed, and farm inputs such as fertilizers, soil conditioners, or crop protection materials, but shall exclude vaccines.
- Organic operators shall not use ingredients, additives or processing aids derived from GMOs.
- Inputs, processing aids and ingredients shall be traced back one step in the biological chain to the direct source organism from which they are produced to verify that they are not derived from GMOs.
- On farms with split (including parallel) production, the use of genetically engineered organisms is not permitted in any production activity on the farm.
- The use of nanomaterials is prohibited in organic production and processing, including in packaging and product contact surfaces. No substance allowed under this standard shall be allowed in nano form.

6.1.Crop production

6.1.1. Choice of Crops and Varieties and propagation of planting materials

General Principle

Species and varieties cultivated in organic agriculture systems are selected for adaptability to the local soil and climatic conditions and tolerance to pests and diseases. All seeds and plant material are organic.

Requirements:

- Operators shall use organically produced seed and planting material whenever available in appropriate varieties and quality. When organic seed and planting materials are not available in sufficient quantity or quality for the required variety or equivalent varieties, in-conversion materials may be used. When none of these are available, conventional materials may be used provided that they have not been treated with post-harvest pesticides not otherwise permitted by this standard.
- Seeds and plant materials shall be propagated under organic management for one generation, in the case of annuals, and for perennials, two growing periods, or 18 months, whichever is the longer, before being certified asorganic seed and plant material.
- Propagation may be based on generative propagation (seeds) as well as vegetative propagation derived from various plant organs :
  a. Partitioned tubers, scales, husks;
  b. Partitioned bulbs, brood, bulbs, bulbils, offset bulbs etc.;
  c. Layer, cut and graft shoots;
  d. Rhizomes;
  e. Meristem culture

7. **Conversion Period (Plant Production)**

General Principle

A conversion period enables the establishment of an organic management system and builds soil health and fertility.

Requirements:

- All the requirements of this standard shall be met for the duration of the conversion period.

- The start of the conversion period shall be calculated from the date that anapplication has been received and agreed to by the control body.
- The length of the conversion period shall be at least:
  - 12 months before sowing or planting in the case of annual production
  - 12 months before grazing or harvest for pastures and meadows
  - 18 months before harvest for other perennials.
- Crops harvested less than 36 months after the application of a prohibited input to crop or soil shall not be used or sold as organic.
- Plant products may be used or sold as "in-conversion" provided that they have undergone a 12-month conversion period.

8. Diversity in Crop Production

General Principle

The development of living soils is the foundation of organic production. Soil health and quality are the basis of soil management practices, are critical to successful pest, disease, and weed management. Organic growing systems are soil based, care for the soil and surrounding ecosystems, provide support for a diversity of species, arebased on nutrient recycling and mit

Requirements:

- Crop rotations for annual crops shall be established to manage pressure frompests, weeds and diseases and to maintain soil fertility, unless the operatorensures diversity in plant production by other means. Crop rotations shall bediverse and include soil-improving plants such as green manure, legumes ordeep rooting plants.
- For orchards and plantations, there shall be managed floor cover and diversity or refuge plantings. igate soil and nutrient losses.

9. Soil Fertility and Fertilization

General Principle

Organic farming returns microbial, plant or animal material to the soil to increase or at least maintain its fertility and biological activity.

Requirements:

- Soil organic matter, microbial activity and general soil health and fertility shall be improved if low and maintained or improved if satisfactory. The operator shall prevent over accumulation of heavy metals and other pollutants in the soils.
- Material of microbial, plant or animal origin shall form the basis of the fertility program. Maintenance of fertility may not rely solely on off-farm inputs.
- Nutrients and fertility products shall be applied in a way that does not harm soil, water, and biodiversity.
- Fertility amendments that are rapidly available to the plants are exceptionally allowed only as a necessary complement when other fertility building techniques have been applied and are insufficient.
- Mineral fertilizers shall only be used in a program addressing long-term fertility needs together with other techniques such as organic matter additions, green manures, crop rotations and nitrogen fixation by plants. Their use shall be justified by appropriate soil and leaf analysis or diagnosed by an independent expert.
- Mineral fertilizers shall be applied in the form in which they are naturally composed and extracted and shall not be rendered more soluble by chemical treatment.
- Chilean nitrate and all synthetic fertilizers, including urea, are prohibited.
- The production of terrestrial plants shall be soil-based. The production of such crops in hydroponic systems is prohibited. “Soil-based” means that apart from the propagation or seedling stages, a plant must spend its life in the soil. For herbs, flowers and ornamentals in pots that are sold directly to the final consumer, the CB can allow production on permitted growing media.
- The removal of soil from the farm is prohibited. Incidental removal of soil when harvesting crops is permitted.
- For mushroom production, substrates shall be made of products of organic agriculture, or other non-chemically treated natural products such as peat, wood, mineral products or soil.

10. Pest, Disease and Weed Management

General Principles

Organic farming systems apply biological and cultural means to prevent unacceptable losses from pests, diseases and weeds. They use crops and varieties that are well adapted to the

environment and a balanced fertility program to maintain fertile soils with high biological activity, locally adapted rotations, companion planting, green manures, functional biodiversity, habitat management, beneficial organisms and other recognized organic practices as described in this standard.

Requirements

- The organic production system shall include biological, cultural and mechanical mechanisms to manage pests, weeds and diseases. These include:

a. Choice of appropriate species and varieties;

b. Appropriate rotation programs, intercropping and companion planting;

c. Mechanical cultivation;

d. Protection of natural enemies of pests through provision of favorable habitat, such as hedges, nesting sites and ecological buffer zones that maintain the original vegetation to house pest predators;

e. Natural enemies including release of predators and parasites;

f. Mulching and mowing;

g. Grazing by animals;

h. Mechanical controls such as traps, barriers, light and sound.

i. On-farm preparations from local plants, animals and micro-organisms.

- When these measures are not sufficient, pest, disease and weed management substances permitted undertable 2 may be used.
- Substances that do not appear on table (2) are prohibited for use in organicproduction.
- Physical methods for pest, disease and weed management are permitted,including the application of heat.
- Thermal sterilization of soils is prohibited.

- Any formulated input shall have only active ingredients listed in Table (2).All other ingredients shall not be carcinogens, teratogens, mutagens, or neurotoxins.

Table4: crop protectants and growth regulators

Substances description, compositional Requirements	Conditions for use
I. Plant and animal origin	
Algal preparations	As far as obtained by: (i) physical processes including dehydration, freezing and grinding; (ii) extraction with water or potassium hydroxide solutions, provided that the minimum amount of solvent necessary is used for extraction; (iii) fermentation
Animal preparations and oils	
Beeswax	
Chitin nematicides (natural origin)	Not processed by acid
Coffee grounds	
Corn gluten meal	
Dairy products (e.g.Milk, casein)	
Gelatin	
Lecithin	
Natural acids (e.g. Vinegar	

Plant oils	
Propolis	
Pyrethrum (Chrysanthemum cinerariaefolium)	The synergist Piperonyl butoxide is prohibited
Quassia (Quassia amara)	
Rotenone (Derriselliptica, Lonchocarpusspp. Tephrosia	Not near waterways. Subject to approval by the CB
Ryania (Ryaniaspeciosa)	
Sabadilla	
II. Mineralorigin	
Chloride of lime (calcium chloride)	
Clay (e.g. Bentonite, perlite, vermiculite, zeolite)	
Copper salts (e.g. Sulfate, hydroxide, oxychloride,	Max 6 kg Cu/ha per year (on a rollingaverage basis)
Diatomaceousearth	
Light mineraloils (paraffin)	
Lime sulfur (Calcium polysulfide)	
Potassium bicarbonate	
Calcium hydroxide (hydrated lime) For application on aerial	For application on aerial plant parts only
Silicates (e.g. Sodium silicates, quartz)	
Sodium bicarbonate	
Sulfur	
III. Microorganisms	
Fungal preparations (e.g.Spinosad)	
Bacterial preparations (e.g. Bacillus thuringiensis)	
Release of parasites, predators and sterilized insects	
Viral preparations (e.g. Granulosisvirus)	
Iv. Others	
Biodynamicpreparations	
Carbon dioxide	Shall not be the result of burning fuel solely to

	produce carbon dioxide; allowed only as a by-product of other processes.
Ethylalcohol	
Homeopathic and Ayurvedicpreparations	
Iron phosphates (for use as molluscicide)	
Seasalt and salty water	
Soft soap	
V. Traps, barriers, repellents	
Physical methods (e.g. Chromatic traps, mechanical traps)	
Mulches, nets	
Pheromones – in traps and dispensers only	

(IFOAM,2014)

11. Avoiding Contamination

General Principle

All relevant measures are taken to ensure that organic soil and organic products are protected from contamination.

Requirements:

- The operator shall monitor crops, soil, water, and inputs for risks of contamination by prohibited substances and environmental contaminants.
- The operator shall employ measures including barriers and buffer zones to avoid potential contamination and limit contaminants in organic products.
- All equipment from conventional farming systems shall be thoroughly cleaned of potentially contaminating materials before being used on organically managed areas.
- For synthetic structure coverings, mulches, fleeces, insect netting and silage wrapping, only products based on polyethylene and polypropylene or other polycarbonates, and biodegradable materials (e.g., starch based), are permitted. These shall be removed from the soil after use and shall not be burned on the farmland.

12. Protected cropping

General principle

All the rules on crop production apply to protected cropping, including those concerning conversion period, diversity of crop production and soil fertility and fertilization. Natural light, air and water are essential components of organic plant production.

Requirements:

- Artificial light is only allowed for plant propagation and as a complement to sunlight to extend the day length to a maximum of 16 hours.
- Operators shall monitor, record and optimize any energy used for artificial light, heating, cooling, ventilation, humidity and other climate control.

13. Breeding of organic varieties

General Principles

Organic plant breeding and variety development is sustainable, enhances genetic diversity and relies on natural reproductive ability. It aims for new varieties particularly suited for organic production systems. Organic breeding is always creative, cooperative and open for science, intuition, and new findings. Organic plant breeding is a holistic approach that respects natural crossing barriers. Organic plant breeding is based on fertile plants that can establish a viable relationship with the living soil. Organic varieties are obtained by an organic plant breeding program.

Requirements:

- To produce organic varieties, plant breeders shall select their varieties under organic conditions that comply with the requirements of this standard. All multiplication practices except meristem culture shall be under certified organic management.
- Organic plant breeders shall develop organic varieties only on the basis of genetic material that has not been contaminated by products of genetic engineering.
- Organic plant breeders shall disclose the applied breeding techniques. Organic plant breeders shall make the information about the methods, which wereused to develop an

organic variety, available for the public latest from thebeginning of marketing of the seeds.

- The genome is respected as an impartible entity. Technical interventions into the genome of plants are not allowed (e.g. ionizing radiation; transfer of isolated DNA, RNA, or proteins).
- The cell is respected as an impartible entity. Technical interventions into an isolated cell on an artificial medium are not allowed (e.g. genetic engineering techniques; destruction of cell walls and disintegration of cell nuclei through cytoplast fusion).
- The natural reproductive ability of a plant variety is respected and maintained. This excludes techniques that reduce or inhibit the germination capacities (e.g. terminator technologies).

14. Animal husbandry

14.1. Animal Origin and Conversion Period

General Principle

Organic animals are born and raised on organic holdings. Animal husbandry systems that change from conventional to organic production require a conversion period

Requirements:

- All the requirements of this standard for land and animals must be met for the duration of the conversion period before the resulting product may be considered as organic. Land and animals may be converted simultaneously.
- Offspring may be considered organic only if their mother has been organically managed throughout the pregnancy.

Milk may be considered organic only if the dairy animal has been organically managed throughout the pregnancy preceding lactation.

Eggs may be considered organic only if the poultry has been organically managed from 2 days old.

- Animals for meat shall be raised organically from birth.

- Breeding stock may be brought in from conventional farms to a yearly maximum of 10% of the adult animals of the same species on the farm. Nonorganic female breeding replacements must be nulliparous.

15. Breeds and Breeding

General Principle

Breeds are adapted to local conditions.

Requirements

- Breeding systems shall be based on breeds that can reproduce successfully under natural conditions without human involvement.
- Artificial insemination is permitted.
- Embryo transfer techniques and cloning are prohibited.
- Hormones are prohibited to induce ovulation and birth unless applied to individual animals for medical reasons and under veterinary supervision.

16. Animal Nutrition

General Principle

Organic animals receive their nutritional needs from organic forage and feed of good quality.

Requirements

- Animals shall be fed organic feed.
- Animals shall be offered a balanced diet that provides all of the nutritional needs of the animals in a form allowing them to exhibit their natural feeding and digestive behavior.
- More than 50% of the feed shall come from the farm unit itself, surrounding natural grazing areas, or be produced in co-operation with other organic farms in the region. For the calculation of feeding allowances only, feed produced on the farm unit during the first year of organic management may be classed as organic. This refers only to feed for animals that are being produced within the farm unit. Such feed may not be sold or otherwise marketed as organic.

- The following substances are prohibited in the diet:

a. Farm animal byproducts (e.g. abattoir waste) to ruminants;

b. Slaughter products of the same species;

c. All types of excrements including droppings, dung or other manure;

d. Feed subjected to solvent extraction (e.g. hexane) or the addition of other chemical agents;

e. Synthetic amino-acids and amino-acid isolates;

f. Urea and other synthetic nitrogen compounds;

g. Synthetic growth promoters or stimulants;

h. Synthetic appetizers;

i. Preservatives, except when used as a processing aid;

j. Artificial coloring agents.

- Animals may be fed vitamins, trace elements and supplements from natural sources
- Young stock from mammals shall be provided maternal milk or organic milk from their own species and shall be weaned only after a minimum period as specified below:

a. Calves and foals: 3 months

b. Piglets: 6 weeks

c. Lambs and kids: 7 weeks

17. Veterinary Medicine

General Principle

Organic management practices promote and maintain the health and well-being of animals through balanced organic nutrition, stress-free living conditions and breed selection for resistance to diseases, parasites and infections.

Requirements

- The operator shall take all practical measures to ensure the health and well-being of the animals through preventative animal husbandry practices such as:

  a. Selection of appropriate breeds or strains of animals;

  b. Adoption of animal husbandry practices appropriate to the requirements of each species, such as regular exercise and access to pasture and/or open-air runs, to encourage the natural immunological defense of animal to stimulate natural immunity and tolerance to diseases;

  c. Provision of good quality organic feed;

  d. Appropriatestockingdensities

- If an animal becomes sick or injured despite preventative measures, that animal shall be treated promptly and adequately, if necessary, in isolation and in suitable housing. Operators shall give preference to natural medicines and treatments, including homeopathy, Ayurvedic medicine and acupuncture.
- Use of synthetic allopathic veterinary drugs or antibiotics will cause the animal to lose its organic status. Producers shall not withhold such medication where doing so will result in unnecessary suffering of the livestock.
- Prophylactic use of any synthetic allopathic veterinary drug is prohibited.
- Substances of synthetic origin used to stimulate production or suppress natural growth are prohibited.
- Vaccinations are allowed only in the following cases:

  a. When an endemic disease is known or expected to be a problem in theregion of the farm and where this disease cannot be controlled by othermanagement techniques, or

  b. When a vaccination is legally required.

18. Bee Keeping

General Principle

Bee keeping is an important activity that contributes to enhancement of the agriculture and forestry production through the pollinating action of bees.

Requirements

- The areas within a 3 km radius of the hives shall consist of organically managed fields, uncultivated land and/or wild natural areas in a way that ensures access to sources of honeydew, nectar and pollen that meets organic crop production requirements sufficient to supply all of the bees' nutritional needs.
- The operator shall not place hives within a foraging distance (5 kms) of fields or other areas with a high contamination risk (e.g. conventional fields, industrial zones and highways).
- The hives shall consist primarily of natural materials and present no risk of contamination to the environment or the bee products. Use of construction materials with potentially toxic effects is prohibited.
- At the end of the production season, hives shall be left with reserves of honey and pollen sufficient for the colony to survive the dormancy period. Any supplementary feeding in response to unexpected need shall be carried out only between the last honey harvest and the start of the next nectar or honeydew flow period. In such cases, organic honey or organic sugar shall be used.
- Bee colonies may be converted to organic production. Introduced bees shall come from organic production units when available. Bee products may be sold as organically produced when the requirements of this standard have been complied with for at least one year.
- During the conversion period, the wax shall be replaced by organically produced wax, except where no prohibited products have been previously used in the hive and where is no risk of contamination of wax. In cases where all the wax cannot be replaced during a one-year period, the conversion period shall be extended to cover the full replacement of the wax.
- For pest and disease control the following are permitted:

a. Lactic acid, formic acid;

b. Oxalic acid, acetic acid **c.** sulfur;

d. Natural essential oils (e.g. menthol, eucalyptol, camphor);

e. (*Bacillus thuringiensis)*;

f. Steam, direct flame and caustic soda for hive disinfection.

7. Certification procedures

The major steps involved in the certification process are highlighted below **(Pamela,2012):**

Step 1 Submission of an application to a certifier by a farmer: This application contains several documents such as organic system plan; map of the farm; field histories; operator agreement; and report of organic yields and sales.

Step 2 Reviewing the application by the certifier: The certifier will read through the application and assess whether the farm meets the regulations and specifications.

Step 3 The inspector visits the farm: Organic farms are usually inspected annually. However, an impromptu visit may be carried out, usually at the discretion of the certifier. At the end of inspection, the inspector reviews any areas of concern. A report is written by the certifier which is forwarded to the certification agency.

Step 4 Reviewing the inspection report: A decision is made after reviewing the report by the certifier whether it conforms to the standards and regulations.

Step 5 Issuance of the organic certificate.

For a perennial crop, the conversion period is at least three years before the first harvest. The products harvested during the second and third year of conversion are marketed under the name of products in conversion to organic farming and bear the OA mark after the 4th year.

Certification: is a procedure by which a third party, the certification body gives written assurance that an organization system, a process, a person, a product or a service complies with the requirements specified in a standard or a reference system, any entity can engage in a

certification process. In some cases, certification is a regulatory requirement. To deliver a certification, the certification body must be accredited. **(Ecocert, 2012).**

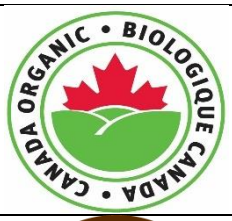
The certification body sends an inspector to visit the producers in the field in order to to grant the organic certification. Before certification can be granted, the farm must go through a a conversion period of two to three years between the conventional system, depending on the country **(IFAD, 2003).** Thereafter an annual inspection is conducted to ensure long-term compliance **(De Loel, 2009)**

A product may be labelled "organic" when the specific rules for organic production defined in one of the defined in one of the regulations recognized by the international community are respected, and that the operator has obtained a valid certificate for this product. For this, each operator must undertake to be inspected by an independent third-party organization accredited according to the ISO 65 guide standard. **(Ecocert,2012)**

The certifying bodies have the right to operate in several countries and their role is to inspect the production line and the examination of the finished product in order to be able to to obtain a certification.

Table 5:Different certifying organization around the world

Country	LOGO	Name of the organization
Algeria	BIO CERT	Biocert Algeria
Tunisia	bio Tunisia بيو تونس	Boi-tunisia

Morocco		Bio-maroc
France		AB agriculture biologique)
Belgium		Biogarantie
Canada		Canada organicregime
USA		Usdaorganic
China		China Organic Product Certification Mark
Austria		AUSTRIA BIO GARANTIE

Australia		AUSTRALIAN ORGANIC
Germany		BIO SUISSE

Chapter 03

This chapter aims to provide elements on the geographical and methodological framework of the thesis. The 1st section is devoted to the human and natural environment and the 2nd is for the course of the investigation.

1. The purpose of the survey

The purpose of the farmers' survey is to know the know-how and how organic farming practices are of the Biskra region.

2. . Presentation of study area

2.1. Geographical location:

The Ziban region extends over the foothills of the Saharan Atlas, which is divided into three mountainous massifs: the Zab, the Aurès and the Némemchas, just to the contact flexure between the rigid and tabular Saharan shield and the very marked folds of the Atlas.

The Biskra wilaya is located in the north-east of the northern Sahara, it covers an area of 21671 km², and has a population of more than 869215 inhabitants. It is limited to the North by the wilaya of Batna, to the North East by the Wilaya of Khenchela, to the North West by the Wilaya of Msila, to the East by the Wilaya of Tebessa, to the West by the Wilaya of Djelfa, to the South by the Wilaya of El Oued and Ouargla. The Biskra Wilaya is composed of twelve dairies, each comprising one or more communes, in total thirty-three communes **(AGIRE, 2016).**

This called the Ziban, an Arabic word that means Oasis together, plural of Zab, Biskra is a dynamic agricultural region characterized by a piedmont divided into two compartments on both sides of the city **(Belguedj et al, 2008).**

- Zab el - Biskri, oasis of Biskra.
- Zab Chergui (Eastern Zab).
- Zab guebli (Southern Zab).
- Zab Dahraoui (Northern Zab).

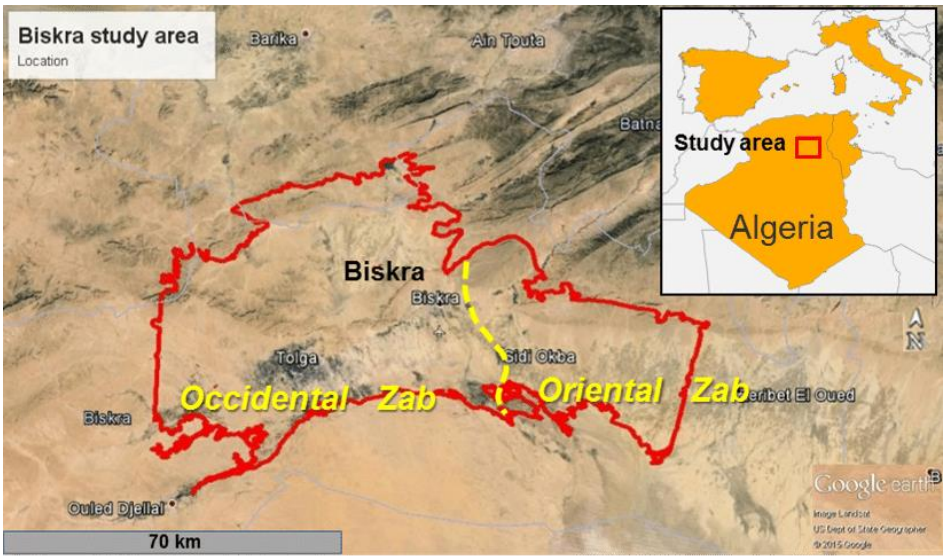


Figure 10: Biskra study area (Gabriela Mihaela Afrasinei,2017)

2.2. Relief

According to the National Agency for Spatial Planning **(A.N.A.T de Biskra, 2002)**, however, the region is marked by four major geographical groupings:

- Mountains, which borders the northern limit of the wilaya, the djebel. Taktiout culminating of the wilaya which rises to 1942m altitude.
- The plateaux, located in the west of the wilaya, this area extends from north to south and constitutes in part the territory of the daira of Ouled Djellal and that of Tolga.
- The plains, which occupies the central area of the wilaya, these are the (3) large plain of El Outaya, Sidi Okba and that of Doucen.
- The depressions, located in the south-east of the wilaya, it is in fact chotts area with negative altimetry (reaching in places 40cm), this area constitutes the point of convergence and natural enforceability of the majority of large wadis that drain the wilaya.

2.3. Plant cover

The natural vegetal cover encountered through the wilaya is of degraded type, it consists of tufts of sparse plants adapted to the soil and climate. In the southern zone, vegetation is becoming rarer and more degraded due to the overexploitation of the few green

layers, the Northern, mountainous area is quite bare except to do for some rare forest areas like the M'Ziraa region is the highest point of the wilaya, the djebel Taktiout**(A.N.A.T, 2002).**

2.4. Water resources in the Biskra wilaya

2.4.1. Surface water resources

Water resources are one of the main resources on which all economic and social development activities are based. Surface water resources are ubiquitous in the study area and are primarily supplied by the major wadis, namely: Wadi Jedi, OouedBiskra, Wadi El Arab, Wadi El Abiod etc., which are characterized by intermittent flow. During the floods, these wadis flow into the Chott Melghir and this because of lack of infrastructure for the mobilization of these resources: dams (Foum El Gherza and Fountains des Gazelles), the dams of infero-flux, hill impoundments, resulting in a great loss for a better use of this element essential to any activity **(ANAT., 2003).**

2.4.2. Groundwater resources

The wilaya of Biskra presents several aquifers of distinct importance due to their lithological constitution, their geological structure and the exploitation facilities they present. These aquifers belong to the following levels **(ANAT., 2003):**

- The Mio-Plio-Quaternary (represented by the sand sheet and the surface sheet of the Quaternary).
- The Lower Eocene (limestone layer).
- The Senonian superior (Maestrichtian).
- L'Albien and Barrémien (interlayer continental tablecloth).

The wilaya of Biskra totals 11,121 points of water, of which 7699 in service, 1846 at the stop and 1576 abandoned. The volume of water extracted is 577 Hm3/year of which 508 Hm3/year is for irrigation and 68 Hm3/year for drinking water supply **(ANAT., 2003).**

2.5. Soil

Soil studies have shown that the soils of the Biskra wilaya have the following characteristics:

- The southern region, are mainly characterized by salty, gypsy and calcareous accumulations.
- The Eastern region, are defined by alluvial soils and fertile clay soils.

- The Northern region (or mountain areas) is the site of the formation of low-yielding and advanced soils.
- Finally, the plain northwest of Biskra where clay-sodic soils are irrigated by heavily mineralized waters that constitute the character of the pedogenesis of this region **(Boukhelouf, 2018).**

2.6. Agricultural production dynamics in the Biskra region

Zab Gharbi (West Ziban) is an old Phoenician region, traditionally irrigated by springs springing at the foot of the Zab Mountains, today by drilling. It has two rows of palm groves, one at the foot of the massifs while the other is about ten kilometres downstream. After the sluggish period of the 1960s - 1970s, agriculture was revived by two successive programs: the APFA in 1983, ensuring access to land ownership for those who develop the land; the PNDA in 2000, guaranteeing access to finance to those who develop agriculture (generally 70% of the funds are paid by the State, the rest being obtained through the banking network). This double contribution has resulted in a renewal of the phoeniciculture, by new plantations: the cores of the old palm groves around each locality are now ennobled in a set planted which is almost continuous from El Ghrouss to Bouchagroun. It has also resulted in a spectacular rise in plasticulture, often on the margins of palm groves, with each operator with 2 to 20 plastic tunnels, which provide immediate income while young palm plantations enter production. With more than 2.2 million palm trees (half of which are in Deglet Nour), the Biskra Wilaya now exceeds the traditional production region **(Côte, 2005).**

Since the implementation of the NADP, the beginning of achievements in numbers **(DSA., 2003).**

- Phoeniciculture = more than 6000 ha.
- Fruit growing = more than 600 ha. Market gardening = more than 250 ha.
- Forest and tree planting = 374 ha.
- Land development/concessions = 300 ha.

3. Climatology of Biskra

The characteristics of the Saharan climate are due, first of all, to the situation in latitude, at the level of the tropic, which leads to high temperatures,this climate is

characterized by weak and irregular precipitation, intense brightness, high evaporation and wide temperature variations **(Chehma, 2011).**

3.1. Precipitation

The precipitation for the Biskra region is very low and especially very variable. Note that the rainiest month is January, while July is the driest month. The precipitation pattern in the study area is presented in the following table:

Table 6: The average monthly precipitation in the Biskra region for the period 1989-2018. **(ONM)**

Month	**J**	**F**	**M**	**A**	**M**	**J**	**JY**	**A**	**S**	**O**	**N**	**D**	**Total**
P(mm)	**20.6**	**12.1**	**13.9**	**16.1**	**11.3**	**7.9**	**1.7**	**4.3**	**15.9**	**17.1**	**16**	**13.9**	**150.8**

P: precipitation (mm)

3.2. Temperature

Temperatures are of the Saharan type, characterized by high temperature maximums in summer and very low in winters. The region also has significant thermal differences, between the maximum during the day and the minimum during the night, exceeding about twenty degrees Celsius. Table (7) shows the monthly average temperatures in the Biskra area.

Table 7: Average monthly temperature (minimum, maximum and average) for the study area over the period (1989-2018). **(ONM)**

Month	J	F	M	A	M	J	JY	A	S	O	N	D	Annual average
T max	17	19.1	23.2	26.8	32.4	37.5	40.8	40	34.7	29	22.2	17.	28.4
T min	6.8	8.2	11.5	15.2	20	24.5	27.9	27.7	23.4	18.2	12	8.1	17
T moy	12	13.8	20.7	20.7	26.2	31.1	34.4	33.8	28.9	23.6	17.1	13	22.7

- Mean monthly minimum temperatures in (°C).
- Mean monthly maximum temperatures in (°C).
- The average monthly temperature in (°C).

3.3. Wind

Wind is a significant meteorological factor; it is the most characteristic of the climate. As well as it is one of the factors that increases evapotranspiration that helps to dry out the atmosphere. Mean wind speed data for the study area are recorded in the following table:

Table 8: The monthly average wind speed in the Biskra region for the period 1989-2018. **(ONM)**

Month	J	F	M	A	M	J	JY	A	S	O	N	D
S(m/s)	3	3.5	3.7	4.1	3.9	3.4	2.9	2.8	2.9	2.9	3	2.8

S: wind speed (m/s).

3.4. Relative humidity of air

The two months July and August are the driest months but December and January are the wettest months. Generally, the humidity is relatively low in the Biskra region, which is explained by the aridity of the climate and the concentration of the warm air masses of the Sahara. Monthly mean values of relative humidity of air vary between 26% and 59%. Data characterizing the relative humidity of air in the Biskra region over the period 1989 to 2018 are reported in the table below:

Table 9: Monthly mean humidity in the Biskra region for the period 1989-2018. **(ONM)**

Month	J	F	M	A	M	J	JY	A	S	O	N	D
rH(%)	56	49	43	39	33	30	26	30	40	48	54	59

3.5. Insolation

Insolation is an important factor in that it directly influences the degree of vegetative activity of the crops. Data for the Biskra Region Average Actual Monthly Insolation for the period 1989-2018 are presented in Table ():

Table 10: The sum of the Biskra Region Average Actual Monthly Insolation for the period 1989-2018. **(ONM)**

Month	J	F	M	A	M	J	JY	A	S	O	N	D	Moy
I(h & 1/10h)	224.2	223.4	262.6	285.8	320.8	331.6	356.6	326.7	270	246.9	220.6	217.8	273.9

I: Insolation (hour).

3.6. Evaporation

Evaporation increases from January to July and decreases until December. In the region of Biskra The maximum evaporation is reached in July and the minimum in December. Monthly average evaporation data for the study area are presented in the table below:

Table 11: Monthly average evaporation for the Biskra region over the period (1989-2018). **(ONM)**

Month	J	F	M	A	M	J	JY	A	S	O	N	D
Evapo	110.52	134.94	189.42	245.59	317.01	373.08	411.02	376.27	287.85	208.61	141.89	108.58

Evapo :evaporation (mm)

4. The progress of the survey

The survey is conducted from December 2021 to February 2022, with farmers in the study area according to direct contact (Face-to-face), and the questionnaire was structured in the vernacular dialect, based on a questionnaire designed for the purpose of the study.

4.1. Presentation of the sample

We conducted 50 direct interviews on the basis of a simple and short questionnaire.The transfer of a 6-page questionnaire consisting of 46 questions in which 35 are closed question and 8 are open question and the rest 4 questions are mixed.These farms are spread over six communes: (Bouchagroune, El Hadjeb, Mkhadma, Tolga ,Foughala and Lichana) as shown in the following table:

Table 12: Farm sites studied

Communes	**Bouchagroun**	**El-Hadjeb**	**Mkhadema**	**Tolga**	**Foughala**	**Lichana**
Farmers	1	6	19	18	3	3

4.2. Questionnaire presentation

The questionnaire is structured into three categories:

4.2.1. About the farmer

It contains questions related to the farmer, the name,age ,level of education ,agricultural education ,main activity , experience ,residency, location. The majority of questions are closed and have multiple choices.

4.2.2. About the farm

It contains questions related to the farm and the techniques used there, it is divided into 3 parts:

- The first one is the surface both used and unused.
- The second part is about the irrigation (water source, irrigation system, frequency of irrigation and most irrigated stage).
- The last part is about activities divided into crop production (palms production, arboriculture and low grad culture), and animal production (manure usage, animal well-being).

4.2.3. About the organic production

We asked about the farming neighbors and there uses to chemicals then we asked them if they know about the organic farming, the obstacles.

4.3. The data and information collected

After completing the questionnaire, a statistical database was used to analyze data from the questionnaire and integrate the analyzed data into curves, histograms andproportional circles for the processing and statistical analysis of the data, we used to excel software.

Chapter 04

In this chapter we will present the main results we obtained from the survey with the farmers.

1. About the farmer

1.1. Age of farmers

The age classification we have adopted is proposed by the **(IPGRI,2005).** In the Biskra region (Zab el gharbi), the majority of respondents are elderly. About 54% of their workforce between the ages of 40 and 60, compared with 34% over the age of 60. The Young people surveyed representsonly 12%.

For the age of farmers in the region, it has been noted that Phoenicians are at least old, which means that they have experience in this field and a great relationship with date palm, but it can still be said that the know-how is threatened to disappear. It seems that the young people of this region are not interested in this culture.

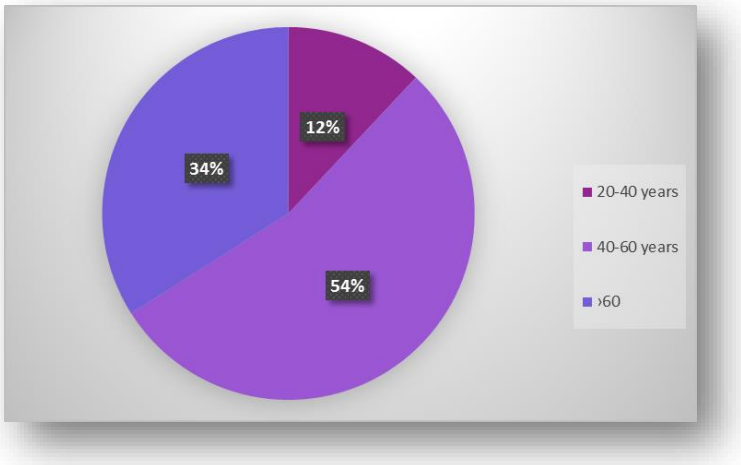


Figure 11:Age of farmers

1.2. Education

The proportion of respondents who are analphabetic is 18%, while the primary level is 22%. A rate of 28% of farmershave an average level, 18% have a secondary level and 10% have a university level.We notice from the figure that just 8% of the farmers have done an agro-education.

Most of these people were able to collect this know-how through inheritance, or through contact with the elderly.

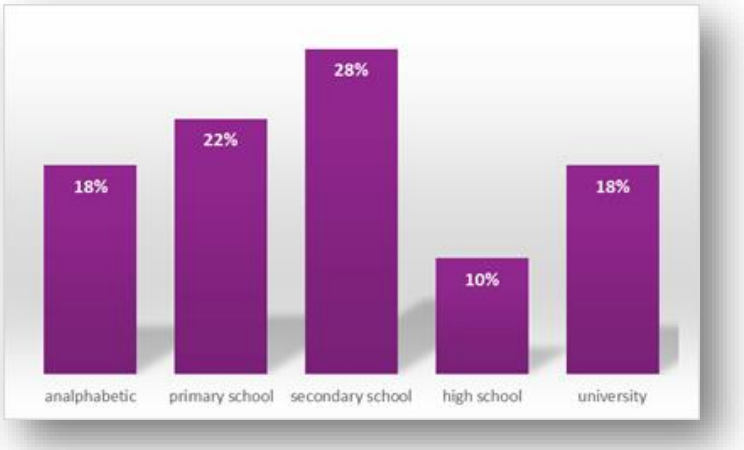


Figure12:Education of farmers

1.3. Main activity and experience

Survey results show that 56% of farmers are engaged in farming as a secondary activity. They are either civil servants or pensioners whose duties they perform in the private sector outside agriculture. In other words, they do not rely on operating revenues as a financial source. These operators move to the farms only finally by week; while others, only at the time of harvest. This constraint accentuates the view of subjectivity, as to this category of farmers, on the oasian farm. This leads to irresponsible management of productive land **(Faci, 2018).**

The rest of the farmers (44%) are engaged in agriculture as their main activity. The majority of those who work only at the palm grove are old people who do not benefit from the pension scheme.

In terms of the farmers' years of experience, their answers show that the largest farmer has 45 years of experience and the least farmer has only two. We divided the years of experience into four, between 1 to 10 years of experience, with an average of 8%, and between 11 to 20 years of experience representing 30%, and between 21 to 30 years of experience with an average of 10%, between 31 to 45 years of experience with an average of 24%.While 34% of farmers did not answer this question and avoid it.

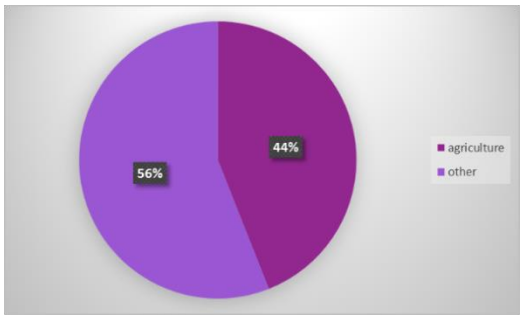


Figure 13:Main activity

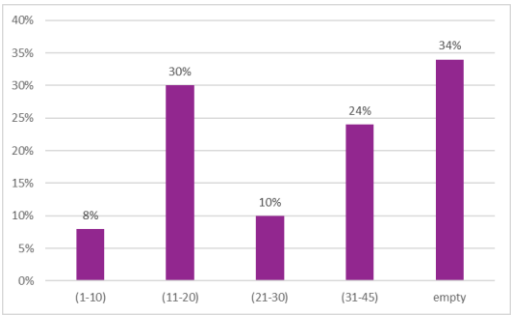


Figure 14:Farmer's experience

1.4. Residence

Most of the operators reside in the study station, it was also noted that none of these operators reside within its palm grove

The remoteness of palm groves is a major contributor to the degradation of their operations, as their permanent presence limits theft and fire and facilitates the maintenance of operations **(Faci, 2017).**

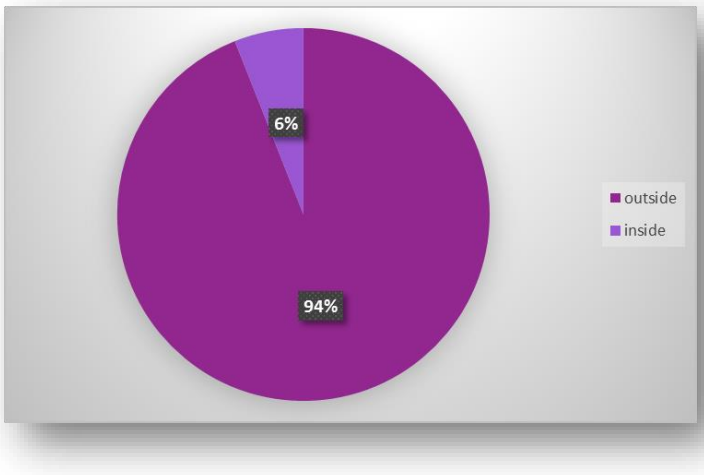


Figure15: Residence of farmers

2. About the farm

2.1. Surface

According to the results of our survey, 16.5% of the farms visited characterized by limited areas between (1 - 3 ha). The plantation is dense and all the farms are occupied by the date palm, something that does not allow the practice of the underlying crops or to plant the fruit trees or even to plant date palm rejects. Holdings with an area between (4 - 6 ha) represent 7.5% of the holdings surveyed. The rest (1%) occupies large areas between (6 ha).

Farmers tend to care less for small plots, so some are virtually abandoned because small plots are less attractive to date collectors and result in significant maintenance costs for landowners **(Benziouche and Cheriet 2012).**

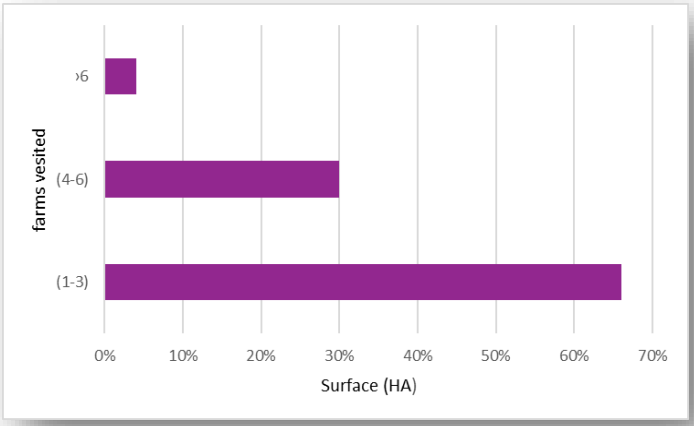


Figure16 :Surface (HA)

2.2. Irrigation

2.2.1. Irrigated surface and water sources

Survey results show that 77% of the surface irrigated while 23% still dry,The different sources of irrigation water encountered on the farms studied are presented in the figure

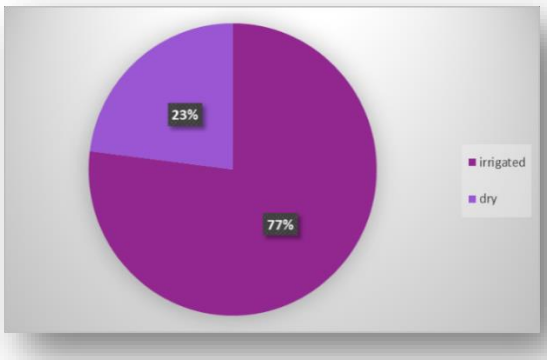


Figure 17: Surface irrigated and dry

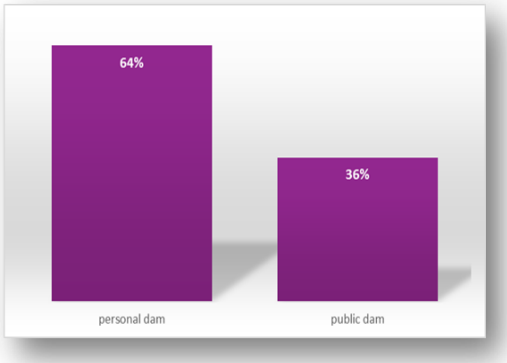


Figure 18: Irrigation source

2.2.2. Irrigation system and frequency

One of the reasons for the development of agriculture in general is the emergence of several modern irrigation systems. Despite the multitude of these new systems, farmers of the region were satisfied with two irrigation systems, namely drop system and run-off.

The frequency of irrigation is usually twice a month. For some farmers, it can decrease to 10 days in summer and three weeks in winter.

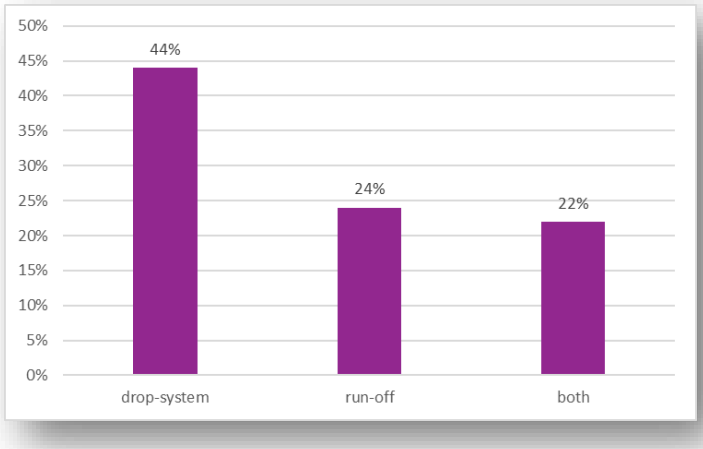


Figure 19: Irrigation system

The frequency of irrigation is usually twice a month. For some farmers, it can decrease to 10 days in summer and three weeks in winter.

3. About the activities

3.1. Date palms groves

3.1.1. Distance between palms

In the palms of the zeb elgharbi region, the spacing between two palms varies according to the farm, 7 meters. Indeed, 100% of farmers surveyed say a spacing between two palms is 7 meter. Distance between palms is the main cause of the high density of plantations found in some palm groves in the Tolga daira **(Benziouche and Chehat, 2010).**According to **Benzaiouche (2015),**spacing is considered one of the determining factors between modern and traditional oases and the distance considered reasonable is 9 metres by 9 metres. The most extensive planting spacing allows the date palm to feed well on elements found in the soil, further develop the root system; and as a result, palm size increases **(Debabeche,2015).**

3.1.2. Palm varieties

The most common cultivars on these farms are: Deglet Nour, Ghars, Mech degla, Male and zoug'meggar, ytima , tentbouchet. The percentage of these cultivars is shown in Figure 20.

A dominance of the cultivar Deglet Nour is due to its high commercial value. While the minimal presence of some other cultivars is to satisfy family needs. Results from **(Benzaiouche,2015)**showed that the Ziban region has a varietal composition distinguished by a predominance of Deglet Nour (plus 78.85%), followed by Ghars (16.37%) and Mech Degla (4%).

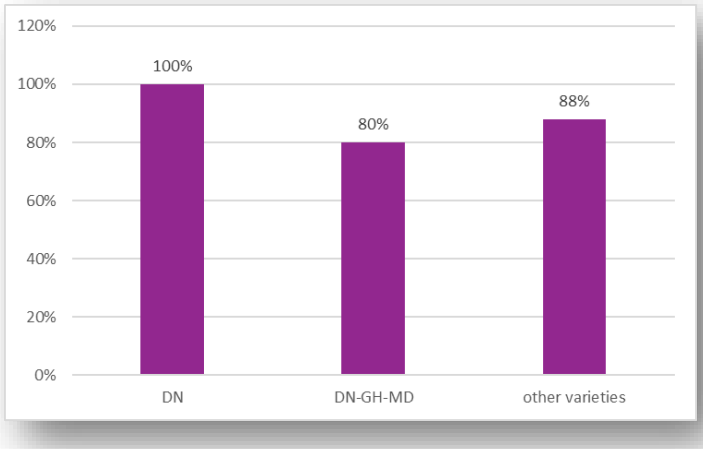


Figure20: Varieties of date palms

3.2. Cultural practice

3.2.1. Fertilization

In terms of soil fertilization, we found that 33% of farmers use fertilizers at different times, most of them (46%) use NPK 15/15/15,(32%) use only Nand (22%) use them both but that does not prevent them from using fertilizers when palm trees were small (Djabbar) to push them to grow and accelerate their growth. The fertilization of the date palm has a great effect on the improvement of production, in quantity and quality. It allows the date palm to be healthy, which gives it good resistance against disease and pest attacks **(Babahani et al., 2015).**

But what we're seeing here is that farmers are using these products as they see fit or on the advice of people who are not experts in this field, the dose is excessive even for conventional agriculture and the application period is false for most farmers according to

(Benharzallah,2020).

And this, despitethere is either academic research in the field especially in fertilization such as:

-The manufacture of a compost from phoenicicolous waste such as (petiole, dry fins, spathe,floral stem) at the level of Ahmad Draya Adrar University, **(Bouziane and Abdelli ,2017).**

-Mulching provides organic matter to the soil and retains moisture and makes it stable with a changein pore geometry **(Lahlou and al., 2005).**

-In addition, the increase in surface crop residues is a food reserve for earthworms and stimulates their foraging activity **(Vian, 2009).**

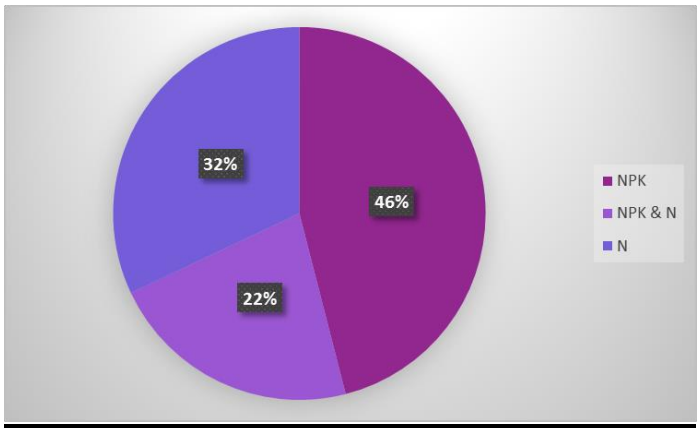


Figure 21: Percentage of fertilization

3.2.2. Manure

78% of the farmers we visited use manure for soil fertilization, the frequency of which varies from once every two years to once every five years, but the dominant frequency is once every three years. These farmers do not use composting, neither mulching nor green manure. The different types of manure used are shown in Figure. When the farmer uses manure, whose source is unknown with improper application of the latter puts his crops in danger, because the composition of the manure must be known to know the minerals, he will provideFight against diseases.

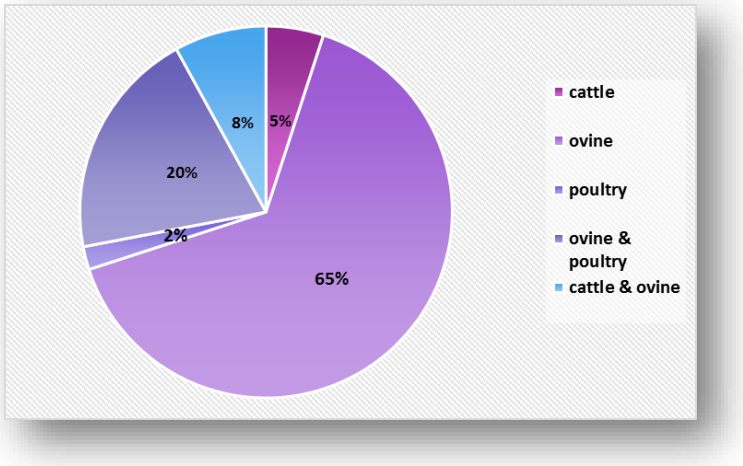


Figure 22: Different type of manure used

All farmers make manure and mineral fertilizers in their palm groves with sand amendments, with the aim of increasing fertility and lowering the salinity of the soil around the palm. Manure and sand are brought in during tillage in January during the dormant period of the palm. Fertilizers are used in different quantities.

3.2.3. Treatments

Diseases, pests and weeds are one of the major problems afflicting the farmer; among the most common pests in the study area are *Oligonychus afrasiaticus* (Boufaroua), date moth (soussa). In general, these problems are remedied by the chemical treatments. In addition to these chemical treatments, farmers use mechanical weeding, salt and lime with sulphur to treat *Oligonychus afrasiaticus* (Boufaroua), date moth (soussa). After a constructive discussion with farmers, we recorded that60% of them use treatments.

Although scientific research and even practices inherited from our ancestors have shown that there are easy and inexpensive organic practices but the farmer uses chemicals, even if he uses his biological practices and their arguments is the lack of labor and time, we quote some: The appearance of new tools and environmental concerns to practice mechanical weeding **(Belaid,2014)**. Destruction is carried out here at very high temperature (direct flame or infrared) over a very low exposure time (3 to 5 seconds) or with the help of appliances: hot water, hot foam, steam, hot air **(http://draaf.auvergne-rhone- alpes.agriculture.gouv.fr)**. There is research on the effect of some plant extracts in the fight against the white scale of the date palm *Parlatoria blanchardi*. This study is carried out at the palm grove of the University of KASDI Merbah de Ouargla and have shown a very high effect significant and among these extracts two have more effectiveness. The use of the sterile insect (TIS) technique of releasing

sterile males into palm groves to reduce this pest to a highly tolerable level of infestation **(Dridi and al., 2001; Zouioueche, 2012)**. There are also bio-pesticides that are also a recourse for farmers who want to practice this mode of agriculture.

3.2.4. Pollination

The majority of palm groves contain Dokkar, which allows farmers to pollinate as much or all of the female plants in their orchards. Farmers who do not have Dokkar in their palm groves can have it from nearby palm groves or buy it from the market. It seems that the best Dokkar for farmers of the prospecting areas is characterized by persistent flowers (which does not easily come off the spikelets) and which does not easily lose their pollen grains and the best bad palms are derived from the kernels of the cultivars Ghars and Mech Degla.

All phœniciculturists of Zeb Elgharbi apply the traditional method for a good production of dates, this operation is carried out manually by the attachment of the male spikelets with female inflorescences after bursting of the spathes, and the rest of the agriculture does not apply the pollination to cause of the abandonment of this cultivars because of three essential causes: hardy displacement, well drying and lack of precipitation.

It is advisable to cut back the male spathes before the flowers bloom to conserve the pollen grains. Pollen should be collected a few hours after opening the spathe to prevent losses. The maturity of the pollen is recognized when the male husks compressed between the fingers produce a characteristic screeching sound. The best date for pollination depends on the variety in question and on climatic conditions and cultural practices. It usually runs from July to August.

3.2.5. Chiseling

All farmers in the Zeb Elgharbi regions practice this technique at the time of pollination.Chiseling the ends of the diets is the removal of 1/5 of diets or 1cm from the end.

They use chiseling at the heart and at the end, to obtain dates of good quality and of large caliber. The chiseling of the spikelet’s at the heart of the diet is an operation, which is very recommended to ensure aeration between the branches of the dates and improve the size and weight of the fruit. It thus contributes to having a good production **(Ayache and Benhafid, 2010 in Debabeche, 2015).**

3.3. Intercropping

Some of the palm groves are grown in a system associated with some crops, lying under the palm tree which characterizes the composition of the palm groves and the diversity of varietal and biological, to cover the family needs by some crops.

Intercropping, between palms, is almost the same on all these farms, mainly grapes, figs and pomegranates andcitrus fruits, olive.

These trees are local and are generally grown for personal consumption (Figures). Almost all intercrops are arboriculture and few of them Low-grade cultures like tomato, water melon and pepper. the rotation of intercrops helps enormously to fertilize the soil but by using dirty plants, cleaning plants, suffocating in general legumes and cereals **(Brahima, 1966)**because trees consume soil resources in contrast to seasonal plants.

Almost all the farmers said that these intercropping do not affect the palm quality only 4 of them complain about the pomegranate which consumes the resources of the soil and considered as a better host for the Boufaroua.

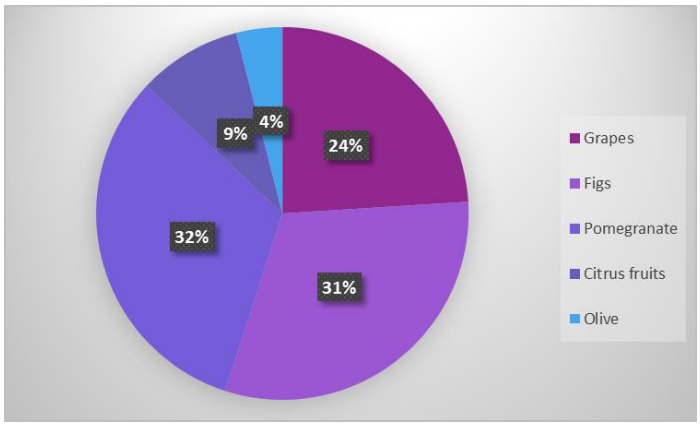


Figure23: Intercropping

3.4. Animal production

The results of our investigations show that the livestock system is very weak and that this system only meets the needs of the family, and it is limited to poultry (24%) , apiculture (3%) , povine (19%) , cattle (19%) and caprine (35%). While the other farms do not practice any type of livestock.

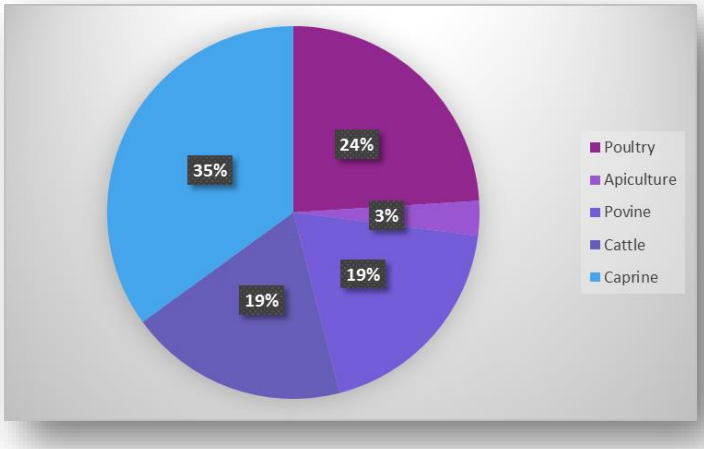


Figure24:Animal production

4. About the organic farming

All the farmers have neighbors, 64% of them use chemicals and the average distance between these farms and neighboring farms is usually 8 meters and 15 meters is limited by a street and is an exception if it is more than that. The majority of farms are separated by embankments, trees and rarely tri-welded or fenced.

From discussing to them, we found that they don't have a lot of information on organic farming, that for the majority of them it's a healthy crop, and for the rest it's non-chemical farming. We point out here that the scientific and educational level of these farmers varies from doctor professor to illiterate. They all hope to produce organic, but unfortunately this is very difficult, especially with the number of diseases that have increased since the use of agricultural greenhouses in the region and also for the quality of the product, from where it became essential to use fertilizers.

Overall, the problems encountered are the certification because it is really expensive and is not available for all the world, the lack of information on new techniques in agriculture especially organic farming, The marketing and instability of the date market are the major economic problems that disturb the farmer.

Conclusion

Conclusion

Phœniciculturehave been practiced for several centuries in the region of Biskra and they continue to progress but in a very timid way despite the important agriculture area in the wilaya of Biskra. At the end of our survey carried out in six districts in west Ziban we note that organic farming is facing a heavy startputting the farmer away from this track despite that the practices of farmers are not far from being organic. Thus, through our survey, the following conclusions could be drawn: :

- Most farmers use chemicals;
- No farmer uses compost, green manure and mulching;
- The dependence of farmers on specific types of fertilizers, mainly NPK or N 46% and chemicals, for the control of diseases and pests. Their selections and applications are made through the exchange of information between farmers and sometimes through agro-suppliers;
- The most common cultivars on these farms are: DegletNour, Ghars, Mechdegla, Male and zoug'meggar, ytima ,tentbouchet while a dominance of the cultivarDegletNour.
- The intercropping is represented by arboriculture and greenhouses. In arboriculture, we found only 5 species of which three are more widespread (fig, pomegranate and grape). These fruit trees consume the soil resources and pomegranate is specifically considered as the best host for Boufaroua.Concerning greenhouse,the main recorded species are: tomato, pepper and melon.
- Most farmers complain about Boufaroua,Soussa and Diss weeds, they use plant protection products to eliminate them.
- Farmers in the region applied two irrigation systems: drop system and run-off.
- The methods on which these holdings have been set up do not allow the transition to organic farming, the most important of which is the small area and the distance between neighboring holdings.

Despite all these practices not in total conformity with the principles of OA, farmers still use means of struggle such as mechanical weeding, salt, lime with Sulphur and manure as fertilizerwhich allow us to conclude that their practices are not so far from being organic especially the region of Tolga. Actually, the other regions, they do not practice OF because of their ignorance in this area, and other causes we quote the most important:

- The lack of a certifying body in Algeria forces farmers to spend more money on certification;
- The lengthy administrative procedures are either for certification or to have agreements with foreign importers.
- Organic farming practices require a large number of workforces.
- The lack of organic awareness among consumers puts organic dates far from their targets because of their high prices.
- The immediate efficacy of plant protection products and chemical fertilizers (without thinking about the consequences).

This modest study remains non-exhaustive compared to the scale of this subject. To know the state of organic farming in the region other surveys must be conducted targeting the maximum number of palm groves and the largest one. Nevertheless, at this stage we can suggest some solutions to make easiest the conversion process to organic farming:

- The state must cover the creation of certifying organizations;
- Organization of training, awareness-raising and extension strategy led by the direct actors in agriculture either for farmers or for the consumer;
- Organic farming must be codified in Algerian regulations;
- Increase state intervention through programs to help farmers interested by producing organic dates;
- Creation of special associations for organic products, especially for organic dates.
- Demonstrate the interest of the biologic and its importance to human health and the environment.
- Set up an OF service at the local level, so that it is the focal point for the actors concerned
- Encourage international business partnerships and participate in international exhibitions
- Strengthen scientific research on OF that takes into account the specificities of regions and products.

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Abstract

The main objective of this work is to study how organic the practices of date palm farmers are, and to assess the feasibility of the converting to organic farmingwith its ongoing launching. In total, 50 farms in Zab-Ouest (Biskra) were visited and evaluated by means of a questionnaire-based survey. The results revealed that farmers in the region applied two irrigation systems: drop system and run-off. The most common cultivars recorded are: Deglet Nour, Ghars, Mech degla, and Male. A high diversity of species and varieties per farm especially figs, pomegranates,grapes was observed. The farmers use manure and a number of pests like Soussa and Boufarouawhose control was mainly chemical. In addition,the livestock system is very weak and that this meeting only the needs of the family.This survey highlighted several obstacles to the practice of organic farming (OF) on most farms in Zab-Ouest as the lack of information among farmers about OF and the lack of state bodies to cover its launch, such as the certifying body. Nevertheless, Tolga seems to be the most potential and promising area for development of OF.

Keywords: organic farming, conventional agriculture, date palm, Farmers practices. conversion, survey, Zab west.

الملخص

الهدف الرئيسي من هذا العمل هو دراسة كيف تكون ممارسات مزارعي نخيل التمر عضوية تقييم جدوى التحول الى الزراعة العضوية مع اطلاقها المستمر. وفي المجموع تمت زيارة 50 مزرعة في الزاب الغربي (بسكرة) وتقييمها عن طريق مسح قائم على الاستبيان. وكشفتالنتائج ان المزارعين في المنطقة طبقوا نظامين للري نظام التقطير والغمر. الأصناف الأكثر شيوعا المسجلة هي دقلة نور والغرسومش دقلة والذكار. لوحظ وجود تنوع كبير في الأنواع والأصناف لكل مزرعة وخاصة التين و الرمان و العنب. يستخدم المزارعون السماد وعدد من الآفات مثل السوسة و بوفروة و التي كانت مكافحتها كيميائية بشكل أساسي و بالإضافة الى ذلك فان نظام الثروة الحيوانية ضعيف للغاية و لا يلبي هذا الا احتياجات الاسرة. سلط هذا المسح الضوء على العديد من العقبات التي تعترض ممارسة الزراعة العضوية في معظم مزارع الزاب الغربي حيث ان نقص المعلومات بين المزارعين حول الزراعة العضوية وعدم وجود هيئات حكومية لتغطية اطلاقها مثل هيئات التصديق. ومع ذلك يبدو ان بلدية طولقة هي المكان الذي يتواجد فيه اغلب الإمكانيات وواعد للتنمية في الزراعة العضوية.

الكلمات الرئيسية: الزراعة العضوية ،الزراعة التقليدية ،نخيل التمر،ممارسات المزارعين. تحويل،مسح،زاب الغربي..

résumé

L’objectif principal de ce travail est d’étudier comment sont biologiques les pratiques des producteurs de palmiers dattiers, et d’évaluer la faisabilité de la conversion à l’agriculture biologique avec son lancement en cours. Au total, 50 fermes de Zab-Ouest (Biskra) ont été visitées et évaluées au moyen d’un questionnaire. Les résultats ont révélé que les agriculteurs de la région ont appliqué deux systèmes d’irrigation : un système de goutte et un système de ruissellement. Les cultivars les plus courants sont : Deglet Nour, Ghars, Mechdegla et Male. On a observé une grande diversité d’espèces et de variétés par exploitation, en particulier les figues, les grenades et les raisins. Les agriculteurs utilisent du fumier et un certain nombre de parasites comme Soussa et Boufaroua dont le contrôle était principalement chimique. En outre, le système d’élevage est très faible et que cela ne répond qu’aux besoins de la famille. Cette enquête a mis en évidence plusieurs obstacles à la pratique de l’agriculture biologique (OF) dans la plupart des exploitations de Zab-Ouest, comme le manque d’information des agriculteurs sur l’OF et le manque d’organismes d’État pour couvrir son lancement, tels que l’organisme de certification. Néanmoins, Tolga semble être la zone la plus prometteuse pour le développement de l’OF.

Mots-clés : agriculture biologique, agriculture conventionnelle, palmier dattier, pratiques paysannes. conversion, enquête, Zab west.